SCIENTIFIC METHOD IN SUPERVISORY PROGRAMS

THE SEVENTH YEARBOOK OF THE DEPARTMENT
OF SUPERVISORS AND DIRECTORS OF INSTRUCTION
OF THE NATIONAL EDUCATION ASSOCIATION

BY A COMMITTEE OF THE DEPARTMENT
PAUL T. RANKIN, CHAIRMAN

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LETTER OF TRANSMITTAL

To Members
Department of Supervisors and Directors of Instruction
National Education Association

Herewith is submitted for your consideration the Seventh Yearbook of our Department. The purpose of this volume is to present the application of the scientific method to the planning and conduct of supervisory activities. That supervision should be scientific is generally accepted. Indeed, the adoption of the procedure of science has been considered so important to supervision that several yearbooks of this Department have been devoted to some aspect of science in supervision. The present yearbook is designed to supply concrete suggestions regarding ways in which each major activity involved in supervision may be carried on as scientifically as possible. The committee hopes that it will prove useful to all persons in supervisory work who desire to proceed in accordance with the tenets of science.

As always in the preparation of such volumes, many members of the Department have contributed. Their assistance is gladly acknowledged. This year, however, no formal attempt was made to secure data from the entire membership of the Department regarding the uses made of the scientific method. Instead, the committee has endeavored to gather and report illustrations of the application of science to each major activity in supervision. The yearbook is intended to be primarily practical in nature, but does include introductory philosophical discussions of the nature and purposes both of supervision and of scientific method.

Despite the fact that work on such a yearbook is difficult and time-consuming, the members of the committee are grateful to the Department for the opportunity to share in this attempt to restate the place of science in supervision.

For the Committee,

PAUL T. RANKIN, *Chairman*

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PREFACE

The Department of Supervisors and Directors of Instruction offers three main services to its membership: the programs of the winter and summer meetings; the monthly journal, *Educational Method;* and the yearbook. Each is designed to make a distinctive contribution to the general purpose of aiding supervisors in their task of improving instructional procedures and results. The programs offer opportunity to hear discussions of current issues in supervision presented by experts. The journal presents brief reports of supervisory experiments and activities, as well as philosophical discussions of basic problems. The yearbook each year gives a relatively comprehensive presentation of some one major aspect of supervision and makes it possible to bring together periodically the products of thinking and experience in some particular field with which supervisors are concerned. The three services complement each other admirably.

This seventh yearbook completes the series projected by the Board of Directors in 1930 as an outgrowth of the issues raised in the third yearbook, *Current Problems of Supervisors.* The fourth, fifth, and sixth yearbooks dealt respectively with the topics, *Evaluation of Supervision, Supervision and the Creative Teacher,* and *Effective Instructional Leadership.*

The particular problem to which the current yearbook is designed to contribute is the use of the method of science in planning and carrying out the supervisory program as a whole. The second yearbook, *Scientific Method in Supervision,* dealt with specific procedures that might be used to gather facts upon which supervisory decisions could be based. *The Evaluation of Supervision,* the fourth yearbook, treated ways and means of appraising supervision in general and various particular activities in supervision. The seventh yearbook, the third to deal with the scientific aspect of supervision, attempts to answer the question,

"How can I as a supervisor incorporate the scientific procedure in each of my regular activities, and especially how can I utilize scientific method in organizing my entire supervisory program?"

Many persons in their thinking restrict the application of the scientific method in supervision to the measurement of instructional results. The committee feels that such restriction is both unnecessary and undesirable. The yearbook is therefore organized to present in the first two chapters fresh statements respectively of the scientific method in education and of the nature and function of supervision, and then to give in subsequent chapters some discussion of how to conduct scientifically each of the chief activities carried on by supervisors.

At the outset preliminary conferences were held with groups interested at Ann Arbor, Bloomington (Indiana), and Chicago. The purpose of these sessions was to discover what supervisors in the field would like to have presented in a yearbook on the application of scientific method to the conduct of the supervisory program as a whole. The suggestions received in the conferences were then considered by the committee, which held three general meetings as follows: Washington, February 23, 1932; Detroit, May 14-15, 1932; Detroit, June 3-5, 1933. In addition, conferences of a portion of the committee were held at convenient times and places where several members were present primarily for other reasons.

As might be expected, there was considerable preliminary groping about at early meetings in order to clarify the problem and to settle upon the best organization for the book. Each member contributed his ideas concerning the service to be rendered by the yearbook and the best mode of organization to secure the ends desired. It was finally decided to try to show the application of scientific method to every major activity in supervision rather than to limit the discussion to the appraisal aspect. It was agreed further to endeavor to provide for the distinctive needs of supervisory workers at both elementary and secondary levels, in both urban and rural situations, in both vertical and horizontal supervisory organizations, and in both building and city-wide supervision.

The committee considered the advantages and disadvantages of several possible outlines and finally decided to organize the yearbook around major functions of supervision, because this arrangement was believed to be most immediately useful to supervisors in the field. The classification of activities adopted was: (1) the organization of supervision; (2) the planning of the supervisory program as a whole; (3) the appraisal of instruction; (4) the promotion of teacher growth; (5) the conduct of curriculum studies; (6) the preparation and installation of courses of study; (7) the selection and preparation of instructional materials.

The committee agreed that the yearbook should be a committee product rather than a series of independent signed chapters. Therefore, the next step was the pooling of the ideas of all members concerning the content and form of each chapter. The entire second meeting of the committee was devoted to this activity, thus insuring that each chapter would represent, as far as possible, the best thinking of every member of the committee. The task of writing the first drafts of the chapters in accordance with the general plan was assigned as follows: Chapter I, Paul T. Rankin; Chapter II, William T. Melchior; Chapter III, W. C. Reavis; Chapter IV, William T. Melchior; Chapter V, Manley E. Irwin; Chapter VI, Helen K. Mackintosh and Lawrence S. Chase; Chapter VII, Prudence Cutright; Chapter VIII, Manley E. Irwin; Chapter IX, Frances R. Dearborn. The drafts were reviewed by the committee as a whole and revised. In the fall of 1933, an editing committee consisting of Manley E. Irwin, W. C. Reavis, and the chairman reviewed the revised drafts and made such further changes as seemed necessary in the interest of unity in the book as a whole.

No systematic attempt was made to secure from the membership of the Department contributions of materials and information relating to the use of the scientific method in supervision. Nevertheless, many individual members assisted materially, both through correspondence and through participation at the regional conferences held during the early stages of committee work. The committee wishes to mention the assistance of two members of

the Department in Detroit, Stella Sufinsky and Wendell Vreeland, who aided in the final editing of the manuscript. J. Cayce Morrison, Ernest Horn, and Mildred English—the three presidents of the Department during the period of study by the committee—furnished most helpful suggestions and coöperation. James F. Hosic, the secretary of the Department, gave freely of his limited time and limitless energy to the project. His counsel was most welcome and greatly appreciated.

A Look into the Future

When a group of people endeavor to think through and formulate so important a matter as the application of science to the supervisory program, the group has perhaps some obligation to offer its general appraisal of the accomplishments of the past in this regard, and its estimate of the possibilities for the future. Such an appraisal is offered, although with some hesitation.

The chief comment is that scientific method is not being applied as completely as possible in every phase of supervision nor in every community employing supervisors. Certain chapters, notably III, IV, VI, VIII, and IX, were difficult to prepare because methods for the application of science to the functions treated are either undeveloped as yet or are used by very few supervisors. Only in the case of Chapters V and VII, dealing respectively with the appraisal of instruction and curriculum studies, are scientific procedures readily available and in fairly general use. Does this mean that scientific methods cannot be applied to the other activities of supervision? The committee does not believe so, and has endeavored to find and present as comprehensively as possible the scientific ways of carrying on every major function supervisors are employed to discharge.

Two implications grow out of these observations which bear upon the application of scientific method to supervision in the future. The first is that supervisors ought to address themselves to the problem of discovering or inventing ways of utilizing the method of science as far as may be in *every* supervisory act, and then to report their findings in order that other supervisors may know them. The journal of the Department, *Educational*

Method, is available for the presentation of reports of effective ways of applying the scientific method to supervisory problems. Perhaps foremost in importance is the use of the scientific method in the planning of the supervisory program as a whole, a preliminary discussion of which appears in Chapter IV. A supervisory program is no better than its plan. A program well planned is half done, and "well planned" certainly involves planning in terms of the facts.

The second implication is that supervisors ought to make sure that they are using all the scientific procedures which have been devised to apply to various supervisory activities. To mention but a single illustration, fairly scientific procedures are available to aid in the selection of instructional materials, and yet they are not in general use. Is not every supervisor obligated, even though he may not have time to share in the discovery or invention of newer procedures, at least to utilize those which are available?

Finally, the committee wishes to affirm its faith in the place of scientific method in supervision. In doing so, the committee does not deny the importance of other elements in worthwhile supervision. In the words of the Third Yearbook committee, supervision should be "philosophic, coöperative, creative, scientific, and effective." Let us as supervisors use to the full the contributions of each aspect.

P. T. R.

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CHAPTER I

SCIENTIFIC METHOD

BEFORE YOU READ THE CHAPTER. Science—the catchword of the modern world! Its application to every sphere of life has brought about such progress in man's control over his environment that it is little wonder science and scientific procedure are highly respected. However, education, like other fields which involve human relations, has been slow to adopt the principles of science. Yet marked gains in educational procedure can already be traced to the use of scientific method. Supervision has been slower than education generally to utilize the method of science, but today is securing valuable results where scientific methods have been applied.

The problem of the entire yearbook is to indicate ways and means of executing the various functions of supervision as scientifically as may be. This first chapter presents the general characteristics and steps of scientific procedure as a background for the more specific applications in subsequent chapters. To the reader experienced in the application of science to supervisory problems the chapter may serve as a review and re-formulation of the field; to the less experienced reader it should give an overview of the purpose and method of science and an appreciation of the potentialities and limitations of the use of science in supervision.

The foreign visitor to public schools in America is impressed with the great diversity in instructional practice which is apparent. In one school system children are taught to spell three thousand words by a definite method—so many new words each week, with provision for review and mastery tests of various kinds; in another system children study only five hundred words, and devote the major portion of their spelling time to the discovery and practice of ways to spell new words that they have not studied. One school organizes the social science program as a series of relatively separate subjects, as, for example, history stories in grades one and two, geography in grades three through six, American history in grade seven, civics in grade eight, world history in grade nine, American history in grade eleven, and economics in grade twelve; another school offers an integrated program of social science from grade one through grade twelve,

organized around major social problems, and utilizing material from the special subject matter fields as needed.

The situation in purely supervisory activities is substantially the same. Principal A centers his supervision around demonstration lessons and discussions growing out of them; Principal B never uses demonstrations—he puts his faith in individual visitation and conference. Superintendent C holds to a chronological age of six for entrance to the first grade; Superintendent D holds to a mental age of six. Reading Supervisor E organizes the course of study around large units, giving the teachers much freedom in their daily plans; Reading Supervisor F presents a course of study which specifies what each teacher is to do each day.

Surely all these contrasting procedures cannot be right—or at least all cannot be best. This statement seems true even if allowance is made for the differences in pupils, schools, and teachers. Such great diversity in practice from room to room, school to school, and community to community implies an equal diversity in belief as to the aims and the methods of education.

What is the significance of the great variation observable in practice and theory in American schools? Or, putting the question another way, under what conditions might unity of practice be expected?

One condition which results in unity is centralization of control. Continental schools are very different from American schools in this regard. In Europe, in France and Germany especially, the school systems are highly centralized and consequently unified. In the United States the dominant tradition has been local autonomy, particularly in school matters. American school people, whether rightly or wrongly, have shied away from the sort of unity that results from central authority and control.

But unity of practice may come from another source, the knowledge of the "truth," of the facts and the relations among them—science, in brief. Where scientific knowledge exists, there practice is unified. For example, the possibility of warding off diphtheria by inoculation with toxin-antitoxin has been demon-

strated conclusively. Practice has therefore become uniform throughout the country: every board of health recommends the use of toxin-antitoxin for the prevention of diphtheria.

The marked variation in practice is evidence that most of our educational problems have not yet yielded to scientific study. Progress is being made: new facts, new relations are being discovered; new generalizations are being formulated. The gain in knowledge about the teaching of spelling, for example, from 1900 to 1934 is very great. But much remains to be learned, and the channel of knowledge is the scientific method.

The Meaning of Scientific Method

What is the method of science? Perhaps the simplest statement is that it is the solution of a problem on the basis of the facts. The purpose is always to solve a problem, to gain control over a situation. The test of the findings of science is the ability to predict and control subsequent action.

Some insight into the meaning of scientific method in education may be gained by stating what it is not. It is not the possession of the vacuous type of open mind. It is not, at least not solely, the application of tests and measuring instruments. It is not the collection of unlimited quantities of data. It is not the application of statistical formulas. Scientific method utilizes measurement and statistics, but they are tools through which to attain understanding of and control over the factors in the problem under consideration.

It should be recognized that all workers in education use the scientific method, to a degree at least. They gather and marshal facts, they array and try out hypotheses, they choose the hypothesis which meets the demands most successfully. The question is not *whether* we shall use scientific procedure but *how* and *to what extent* we shall use it.

The elements of science and scientific method will be presented first as a background for the detailed applications which follow. The sequence of the presentation is: (1) the characteristics of scientific method; (2) the steps in scientific procedure; and (3) the place of scientific method in supervision.

Characteristics of Scientific Procedure

The scientific method has been used in practically every sphere of human activity. On the surface the characteristics of the procedure seem to differ in astronomy, psychology, bacteriology, education, and the other fields. Careful analysis of the applications of scientific method to these different fields, however, reveals certain elements which are characteristic of all. Scientific procedure[1] appears to be characterized by: (1) basis upon facts, (2) quantitative description of facts, (3) suspended judgment, (4) concern with all relevant facts, (5) sensitiveness to problems, (6) effort to discover rather than to prove, (7) continuous appraisal, (8) the quest for ever more inclusive generalizations.

Basis upon facts. The prime characteristic of scientific procedure, in whatever field, is its reliance upon facts. The worker by scientific means is assiduous in his collection of relevant facts; he scrutinizes the facts to make sure of their authenticity and their relevancy; he bases his conclusions and his subsequent action upon the facts which he has discovered.

The automotive engineer who is asked to evaluate a new type of tire is not content to ascertain the opinions of people regarding the probable life of the new tire. He insists rather upon the gathering of facts regarding the life of the tire in miles or in years under certain specified conditions of wear. Similarly, the high school principal who is asked to improve the teaching of Latin in his school cannot be satisfied with the collection of a few opinions from teachers, pupils, and parents. He will endeavor to discover the uses made of ability in Latin by these pupils in later years; he will seek to find out the powers of the pupils in reading and translating Latin as measured by standard tests of abilities in Latin; he will try to discover the degree to

[1] For other statements on scientific procedure, see Pearson, Karl, *Grammar of Science*, third edition (London: Adam and Charles Black, 1911); Columbia Associates, *An Introduction to Reflective Thinking* (New York: Houghton Mifflin Co., 1923); Barry, Frederick, *Scientific Habit of Thought*, second edition (New York: Columbia University Press, 1928); Kelley, Truman L., *Scientific Method*, Chap. I (New York: Macmillan Co., 1932); Lundberg, George A., *Social Research* (New York: Longmans, Green & Co., 1929); and Curtis, F. D., "A Determination of the Scientific Attitudes," *Journal of Chemical Education*, III (August, 1926), 920-927.

which they have been stimulated to use their spare time in reading Latin books or in looking up materials in books which deal with the life of the Romans. The scientific worker always obtains objective facts as far as possible and bases his decision upon them.

In some cases objective facts cannot be secured under present conditions of knowledge and study. Resort must then be had to the collection of subjective facts or opinions. Even here, however, the scientific worker seeks to safeguard his steps by using the most expert judges available, and by pooling the opinions of as many such judges as he can secure.

Quantitative description of facts. A second characteristic of scientific method is the attempt to secure increasing accuracy in the description of facts by the use of measurement. Students of the history of science report that advances in science have paralleled very closely advances in the art of accurate measurement.

Facts always require description of some sort. If the description is to be most useful, it must be as precise as possible. Measurement is nothing more nor less than refined, precise description. A little child says that it is a long way to the North Star. The astronomer says that it is between two hundred and five hundred light years to Polaris. Both have described the distance, but the astronomer has described it with far greater precision because of his use of measurement.

In the field of education, the use of measurement has made possible many advances in education as a science. A short quarter century ago the available measures could be counted on the fingers of two hands; today there are hundreds of measuring instruments, dealing with every educational field. Year by year the boundary line around the "immeasurables" has receded. Much progress has been made toward the ideal implied in Thorndike's oft-quoted statement, "Whatever exists at all exists in some amount. To know it thoroughly involves knowing its quantity as well as its quality."[2] During the first ten or fifteen years of the measurement movement in education, it was frequently said

[2] Thorndike, E. L., "The Nature, Purposes, and General Methods of Measurement of Educational Products," *Seventeenth Yearbook, National Society for the Study of Education,* Part II. Bloomington, Ill.: Public School Publishing Company, 1918.

that there were many phases of human behavior to which measurement could not be applied. In the last decade, however, the Character Education Inquiry[3] and other research projects have demonstrated the practicability of applying measurement to any characteristic of human life which one may wish to describe with precision.

The use of measurement in the interest of accurate description of facts characterizes scientific procedure generally and hence is appropriate in the field of education.

Suspended judgment. A third characteristic of scientific procedure is the attitude of suspended judgment which is exhibited by every truly scientific worker. The person who would operate scientifically needs to guard against making decisions on the basis of too small a number or too biased a sampling of facts. He waits until he has all the evidence which can be secured. He considers hypotheses as matters for trial and investigation and never as facts or laws which are indisputably proven. He withholds decision.

It is apparent that the attitude of suspended judgment which is so surely characteristic of the scientific worker is in conflict with the promptness of decision which is expected of the good executive. The person who is doing supervisory work, whether he be called supervisor, principal, or superintendent, frequently is required to take executive action. Here, as perhaps elsewhere, the virtues of the scientist do not coincide with those of the executive. The solution for the practical school man is probably the retention of open-mindedness and suspended judgment for as long a period as is possible in the situation in order that the decision may be well made. However, it must be recognized that the practical school man cannot always withhold judgment until all the facts are before him; he can only make the best compromise possible between the two ideals which pull him in opposite directions. Even though he recognizes that a decision must be made, he need not sacrifice his scientific attitude.

[3] Hartshorne, Hugh, and May, Mark A., *Studies in the Nature of Character:* I. *Studies in Deceit.* II. *Studies in Service and Self-Control.* III. *Studies in the Organization of Character.* New York: The Macmillan Company, 1928, 1929, 1930.

Concern with all relevant facts. A fourth characteristic of scientific procedure is its concern with *all* of the facts—all of the influences inherent in the situation which is being studied. The older sciences are replete with illustrations of the value of taking into consideration all the facts in a given situation. In the field of education, a supervisor who is studying the implications of left-handedness for handwriting ability dare not neglect the other effects of left-handedness and the results of the attempt to change left-handed pupils into right-handed pupils. The unscientific procedure is to consider only those elements of the situation in which one is immediately interested. An even less scientific procedure, because it involves the concealment of effects, is that in which only favorable data are considered and reported. A scientific worker who is seeking truth is required to gather and report all data which may reveal influence from the factors under study. Absolute honesty in dealing with facts is vital.

At the same time it must be recognized that it is not possible to observe and record every possible associated fact. Individual facts may lead out very far indeed, as is suggested in Tennyson's lines:

> Flower in the crannied wall,
> I pluck you out of the crannies,
> I hold you here, root and all, in my hand,
> Little flower—but if I could understand
> What you are, root and all, and all in all,
> I should know what God and man is.

In practice the investigator seeks to observe and record all facts that appear to be significant. At any rate, he never omits the consideration of data because of fear that they would controvert the conclusion to which his other facts are leading. Here is where a delicate intuition is required of the scientist. He must be ever honest with himself and with his data, yet he must discriminate between the data which are significant and those which are relatively meaningless in the solution of his problem.

An illustration may serve to clarify the point. A supervisor of music may be concerned with helping his teachers devise improved techniques for the early identification of pupils who are talented in music. In this endeavor he will probably disregard

factors that seem extraneous, such as height, weight, nationality, interest in nature study. He will attend to factors which seem indicative of the possession of extraordinary musical leanings, such as ability to carry a tune, sense of rhythm, proportion of leisure spent in listening to or participating in music, evidence of interest in musicians, and so on. However, he will ever be critical of his own decisions as to what are the significant factors. He may discover new meaning in factors which he had disregarded, and he may find that some apparently significant factors are in reality irrelevant.

Sensitiveness to problems. A fifth characteristic of scientific procedure is an ever-present alertness to problems. The scientifically-minded person perceives in situations inconsistencies and coincidences which call for study and explanation. Scientific work ordinarily begins with the recognition of a problem to be solved. During the process of its solution there arise subsidiary problems which must be sensed and met. The true scientist is forever asking *why* and *how*.

Effort to discover—never to prove. A sixth characteristic of the scientific procedure is its concern with the discovery of truth rather than with the substantiation of a particular hypothesis. Probably the type of open-mindedness here implied is the most essential of all the characteristics of the scientific method. There can be no true science where the worker endeavors to prove the truth of his preconceived notion. The investigator must ever remain open-minded regarding the goal to which his work may lead him.

This is the point at which quasi-science may be distinguished most readily from true science. In education, as in some other sciences, workers have occasionally lowered themselves by their efforts to prove that what they believed was true. To paraphrase Lincoln's famous statement: It makes no difference whether truth is on our side, but it makes a great deal of difference whether we are on the side of truth.

Continuous appraisal. A seventh characteristic of scientific procedure is its embodiment of continuous and critical appraisal at every step of the process. The facts which are collected are

subjected to rigid scrutiny to make sure that they are relevant, that they are accurate, that they are adequate for the purpose in hand. The alternative hypotheses which are arrayed as possible solutions of the problem are reviewed to insure that they cover the possibilities comprehensively. The interpretations which are made are considered from every point of view to guard against bias and prejudice. Eternal vigilance in checking and rechecking seems to be vital to any truly scientific activity.

Particularly important is it that the final conclusion be verified by prediction and trial. Thus Pasteur, after exhaustive study, concluded that the fermentation of sterile liquid must be due to something carried by the dust in the air. As a final proof he predicted that, if one flask of sterilized liquid were left open to the dust of the air, and a similar flask were partially closed so that it would admit air but not dust, the one which was entirely open would ferment and the other would not. The experiment was tried and his prediction was borne out.[4] In the field of education also it is not sufficient to arrive at a conclusion: its implications must be predicted and subjected to experimental verification.

Quest for ever more inclusive generalizations. A final characteristic of the scientific procedure is its constant seeking for wider applications, for broader generalizations. A classic illustration[5] of this phase of scientific procedure is the sequence of generalizations from the empirical observations of Tyco Brahe through the laws of planetary motion of Kepler to the law of gravitation as formulated by Newton. Tyco Brahe spent many years in accumulating observations of the positions of the planets. From these observations, he arrived at accurate statements of fact regarding the position of the planets at different times. Kepler took Tyco Brahe's data, subjected them to mathematical analysis and interpretation, and arrived at the three laws of planetary motion which bear his name. From the point of view of

[4] Vallery-Radot, R., *The Life of Pasteur*, p. 108. Garden City, N. Y.: Doubleday, Page and Company, 1924.

[5] For a clear and beautiful statement of the scientific method, and particularly of the illustration here referred to, see the history of astronomy in verse: Noyes, Alfred, *The Watchers of the Sky*. New York: F. A. Stokes Company, 1922.

science, Kepler made a great advance in resuming the thousands of observations made by Tyco Brahe under three brief generalizations. Newton in his turn subsumed these three laws under a single and greater law which we know as the law of gravitation, thus continuing the advance toward more and more inclusive generalizations.

Illustrations of this phase of scientific procedure are difficult to present in the field of education because laws are rarely the outcome of educational endeavor. Yet every student of education tries to discover not only what is best in a limited situation but what may be true also in other similar situations. The supervisor who seeks to discover the best methods of teaching the arithmetic combinations to one group of pupils is ever on the alert for general processes of teaching these combinations to all pupils. This desire to extend generalizations as far as possible is characteristic of the scientist.

Steps in the Scientific Procedure

As in the case of the characteristics of science, the steps may not be perfectly differentiated from each other nor may they be expressed with too great positiveness. Their sequence is not invariable. Their relative importance in different activities may change. Nevertheless, it is helpful to array these steps in chronological order so that they may serve as a kind of check list for the scientific worker. They are as follows:

Discovery and isolation of the problem.
Collection and classification of the necessary facts.
Formulation of possible solutions.
Adoption of criteria of solution.
Trial of hypotheses.
Interpretation and generalization.
Revision and re-trial of hypotheses.

Discovery and isolation of the problem. The first step is the awareness and delimitation of the problem to be attacked. In order to conduct one's work scientifically, one must have a sensitiveness to problems, because science is essentially the discovery and solution of problems.

Ordinarily problems present themselves with great frequency—so great, indeed, that the worker's first task is to select from among the many problems before him those which he should attack first. While, from the point of view of pure science, any problem, any advance in human knowledge is worth while, the practical school person is confronted with the necessity for choice. He may hope that eventually educational workers will meet and solve all problems, but he realizes that certain ones are of far greater importance than others in his immediate situation.

What are the factors which should aid the worker in his choice of problems to be attacked? Surely the answer is not the problems which come first to hand, which arise adventitiously. The chance order in which problems appear is not a significant indication of their relative importance. The factors which should govern the worker's decision are rather such matters as these: the significance of the problem in a long-time program of supervision; the importance of the problem as viewed by teachers; the importance of the problem as viewed by the community; the degree to which solutions have already been discovered and are existent in the literature; the problem's relation to activities conducted in the school system in previous years.

Assuming that the major problems have been identified, it remains to narrow and delimit them. Supervisory problems are generally broad and inclusive. They are too big to be attacked as wholes. They must be broken into subordinate problems and the process of choice repeated among these problems.

In many instances some data must be gathered before the problem itself is revealed. Thus a supervisor who takes a position in a new community where but few data have been accumulated from year to year may find it necessary to survey the situation before he can settle upon the problems which are most pressing in that particular community. Even in the case of a supervisor who feels that he knows his community and its school system well, there may be periodically a need for a re-survey of the situation as the basis upon which to plan his supervisory program. There are distinct advantages in such a survey when it is conducted by methods which have not been used in that

particular system prior to that time. When analysis of needs is made coöperatively by teachers and principals and supervisors, the problems revealed may be recognized as important by all members of the group and their solutions thereby facilitated.

In the choice of problems, the supervisor will do well to discover and weigh carefully community opinion concerning proposed problems. One limitation upon the use of scientific method in supervisory work has been apathy or downright objection concerning certain problems either in the community as a whole or in the professional staff. The way to meet this difficulty is to deal first with those problems that are of admitted interest and value to the entire school community. The practical supervisor must include expediency among the criteria for selection of problems.

Collection and classification of the necessary facts. Granting that the problem has been isolated, the next step ordinarily is to gather data on the basis of which to set up hypothetical solutions. It is true that in some instances the possible solutions are almost inherent in the very phrasing of the problem. Thus, for example, the problem may be one with clear alternatives, such as the relative distribution of time between the composition and literature phases of English in the secondary school. In other cases, such as the development of a mode of teaching spelling which will result in a high order of spelling conscience, the possible solutions may not be so apparent. The supervisor may then need to collect many types of data before he can arrive at a statement of alternative procedures to be evaluated from the point of view of their relative effectiveness in achieving the goal which is sought. For instance, he may study the differences between children who seem to possess a spelling conscience and those who do not. Even before this is done, it may be necessary to develop instruments for measuring the degree to which a spelling conscience is possessed. He may collect from superior teachers a variety of modes of teaching which are believed to result in the desired spelling conscience on the part of children. He may study the life situations in which children and adults show their highest development of a spelling conscience. In

all of these approaches, he will not only gather data from children and teachers but also review the findings of previous students of the problem as presented in the literature.

One phase of this step which has been especially marked in the older sciences is the classification of the data. The general rule of classification is usually phrased as follows: "Place together in classes the things that possess in common the greatest number of attributes." The sciences of botany and zoology probably present the best illustrations of this activity in science. Thus the whale, although it lives in the sea like a fish, is classed as a mammal because it has warm blood and suckles its young as land quadrupeds do.

Obviously, there are many bases of classification which may be used in dealing with any given set of data. Thus the facts which indicate the degree of development of a spelling conscience may be grouped by the age of the pupils, by the internal characteristics of the data themselves, by the situations in which the spelling conscience is demonstrated. Indeed, the superior scientific worker is marked by his originality in setting up many possible classifications from which the most appropriate one may be selected.

Formulation of possible solutions. This step is to array the alternative modes of solution which should be compared in order to discover the best solution. At this point, the mark of the careful scientist is his ability to set up all the contrasting hypotheses, each of which is a potentially "best" solution. A fruitful, original mind is desirable. The danger is that likely leads will be omitted. At the same time the typical person in school work must choose a reasonable number of the most likely hypotheses which may be investigated. The limitations of ordinary school work are such that all the possible alternatives cannot be tried and evaluated in the time available.

A word as to the meaning of an hypothesis may not be amiss. An hypothesis is in essence a guess—a good guess if possible, but at any rate a guess. It is an intuitive leap across the chasm from problem to solution. Truly great scientists have usually been characterized by their almost uncanny ability to select from

among many possibilities the one or two or three which are most likely to prove best. But the great scientist is never content with the hypothesis alone. He subjects it to rigid experimentation to demonstrate that it does, or does not, meet the requirements of his problem. He stands ready to reject his best guess whenever the facts deny its validity.

In the spelling illustration which has been suggested, the supervisor may set up, for example, on the basis of the facts he has gathered, the following optional ways of developing a spelling conscience:

1. Use of all writing situations as practice in spelling.
2. Pupil study of success of business men, stenographers, and others with reference to place of spelling ability in their success.
3. Practice in learning to spell new words by development of generalizations about how to spell.
4. Specific habit training in proof reading.
5. Development of school newspapers and magazines to provide a genuine purpose for accurate writing and spelling.

Since most educational problems involve the selection of the "best" procedure for an adopted purpose, and the various hypotheses become the procedures to be compared, these hypotheses need to be formulated with great care to include all the procedures which seem most likely to attain the purpose set.

Adoption of criteria of solution.[6] After arraying the various proposals, the next step is to determine the bases upon which choice among them is to be made. The formulation of these criteria should always precede any attempt to make a direct comparison among the proposals. Furthermore, the relative importance to be attached to the various criteria may well be settled upon before any actual comparison is made. Otherwise the investigator, after the data are complete, may allow himself to give undue weight to the criterion wherein the proposal leads which he more or less unconsciously favors.

In some instances the criteria for judging the value of the several solutions may be explicit in the problem under investigation.

[6] For a fuller account of criteria and their weighting as applied to the evaluation of supervision, see *The Evaluation of Supervision*, Fourth Yearbook, Department of Supervisors and Directors of Instruction, N.E.A. (New York: Teachers College, Columbia University, 1931), Chapter II; and Rankin, Paul T., "The Choice and Weighting of Criteria of Supervision." *Educational Method*, X (May, 1931), 450-456.

Thus, in the case of the development of a spelling conscience, the criterion is obviously the degree to which such a conscience is developed. Even here, however, various forms of measurement of the attainment of a spelling conscience may need to be devised, and there is the problem of deciding early the relative significance of these various measures.

In other instances the criteria are not pointed to so directly. The supervisor who is confronted with the problem of choosing among several possible textbooks in a given grade and subject needs to array the purposes to be served by the textbook, to decide upon their relative importance, and to devise ways of estimating the attainment of these purposes.

Trial of hypotheses. This involves the comparison of the hypotheses from the point of view of the criteria adopted. The comparison may be made either by observational or by experimental methods. If observation is used, the investigator finds instances of the operation of the several hypotheses, observes the effects upon the criteria he has adopted, and compares these effects without attempting to control other factors in the situation. If experimentation is used, the investigator sets up conditions alike in all respects except the one factor for which he has several hypotheses, observes the operation of these hypotheses under relatively constant conditions, and compares their effects upon the adopted criteria. The difference between observation and experimentation lies only in the amount of control over other conditioning factors. In some situations, as in astronomy, observation is all that is possible, except that a kind of controlled observation may be provided by determining upon the conditions under which observation will be made. In educational work generally, both observation and experimentation are possible and should be used.

The trial of the hypotheses should in all cases be accompanied by measurement and evaluation in terms of the criteria adopted. The distinction between these two terms is phrased by Courtis[7] as follows:

[7] Courtis, S. A., "Possibilities and Potentialities in Measuring the Work of a Principal." *First Yearbook, Michigan Education Association, Department of Elementary School Principals* (1927), p. 9-10.

> Measurement aids evaluation, but measurement is, or should be, always, merely impersonal, objective, precise description. The activity of measurement consists simply of comparing some quantity with a standard quantity of the same kind arbitrarily selected as a unit. Measurement yields facts, but no merit attaches to facts, except as the individual already has a basis of judgment of merit and makes inferences accordingly.
>
> The determination of worth should be called by a different name. I suggest the term of evaluation. It always consists of the comparison of a result, and the product is a judgment that the result is good or bad, according to whether it is or is not the result desired. Change the desire and you automatically change the merit rating although the fact remains the same.

It is apparent that precise description or measurement of all facts relevant to a trial of hypotheses is necessary. But the mere measurement of the factors is not sufficient in itself. The data which are gathered need to be related to the purpose to be attained, or, in other words, to the criteria for judging the satisfactoriness of the solution of the problem which has been set. In consequence, both measurement and evaluation are important.

Emphasis should be placed upon the desirability of providing measurement and evaluation with regard to all criteria. The tendency too frequently is to disregard certain criteria because they are difficult to measure and to interpret. If but a limited number of the criteria are considered, the conclusions may easily be very different from the conclusions which would appear if all the criteria had been taken into account.

The usual classification of experimental trials of hypotheses in education is three-fold: one-group, equivalent-group, and rotated-group.[8] In the one-group plan, but a single group of subjects (pupils or teachers) is used. The initial status of the group in the characteristics adopted as criteria is discovered and recorded, the experimental factor (or hypothesis) is allowed to operate, and a second record is made. The effect of the operation

[8] For further discussion see: McCall, W. A., *How to Experiment in Education* (New York: Macmillan Company, 1923); Crawford, C. C., *The Technique of Research in Education* (Los Angeles: The University of Southern California, 1928); Good, Carter V., *How to Do Research in Education* (Baltimore: Warwick and York, 1928); Almack, John C., *Research and Thesis Writing* (Boston: Houghton Mifflin Company, 1930); Whitney, Frederick Lamson, *Methods in Educational Research* (New York: D. Appleton and Company, 1931); and Abelson, Harold H., *The Art of Educational Research* (Yonkers-on-Hudson, N. Y.: World Book Company, 1933).

of the experimental factor is assumed to be measured by the change from the first to the second record.

In the equivalent-group experiment, two groups are used which are alike in every significant respect except that one hypothesis is allowed to operate in one group and another hypothesis in the other group. Records of status in the characteristics chosen as criteria are made both at the beginning and at the end of the experimental period. The difference in effect of the two hypotheses is assumed to be measured by the difference in the amount of change in the two groups. Obviously, if more than two hypotheses are to be tried, a corresponding number of equivalent groups must be used.

The rotated-group experiment is in reality a combination of the one-group and the equivalent-group methods. Two equivalent groups are used and the experimental period is divided in two. During the first half of the period, hypothesis *A* operates in group 1 and hypothesis *B* in group 2; during the second half of the period, the factors are interchanged, hypothesis *A* operating in group 2, and hypothesis *B* in group 1. Records of status in the characteristics adopted as criteria are made at the beginning, at the change, and at the end of the experimental period. The difference in the effects of the two hypotheses is assumed to be measured by the difference in the average amounts of change under the two hypotheses. If more than two hypotheses are being studied, a corresponding number of groups and of divisions of the experimental period must be used.

All three of these types are used currently in efforts to find which of several hypothetical solutions to an educational problem is best in terms of the effects desired. Even though a study is not carried through formally according to one of these patterns, any attempt to appraise variant procedures in educational situations will need to utilize the principles implied in these patterns of experimentation.

Interpretation and generalization. After data have been secured relating to the trial of the different hypotheses, the next step is to study the data in order to arrive at their meaning and thus to develop the conclusion and generalization which is the

end product sought from the whole series of activities. The interpretation of the results will be much simpler and less biased if the criteria of solution have already been adopted. The problem of interpretation then becomes one of arraying the outcomes from each hypothesis and choosing the set which constitutes the best answer to the basic problem upon which the investigator has been engaged.

The generalization may be in the form of a scientific law which expresses briefly the relation among many facts, or it may be in the form of a judgment as to the best of several contrasted methods of attaining a desired goal. These two types of generalizations which may result from a scientific study illustrate the outcomes of pure science and applied science. The distinction between these was made in the Fourth Yearbook[9] as follows:

> The essential difference between pure and applied science is believed to lie in the purposes to be achieved by each. Pure science is the quest for relationship, usually to be expressed as a law. Pure science makes progress when many facts which are apparently more or less independent are resumed in a single summary statement expressing the relationship existing among them. Pure science achieves its goal when it is able to subsume several such generalizations under a single, more inclusive, and more general one. . . .
>
> Applied science, on the other hand, is the quest for the better of two or more methods or two or more materials. It involves the comparison of two or more alternative ways of attaining a desired goal. Applied science achieves its purpose when the better way, all things considered, is discovered.

In educational work, the choice among procedures for attaining a desired goal is far more frequently the outcome of scientific activity than it is the discovery of law. Laws in education are rare, indeed. Most supervisors and others concerned with the scientific study of educational problems devote their efforts to the comparison of several different ways of doing something in order to find the best for their purpose. Education as a science is essentially an applied science.

The stage of interpretation or generalization is also a period for the revealing of new problems and new aspects of older problems. One mark of science is the way in which the study of

[9] *The Evaluation of Supervision*, p. 26.

one problem seems to lead very directly to the study of other problems that come to light during the study of the first one. Indeed, a most fruitful source of new problems is the conduct of an investigation into almost any problem.

Revision and re-trial of hypotheses. Rarely, if ever, in science is the conclusion truly permanent. Scientists have appreciated this fact increasingly in recent years, when the older laws have been modified under pressure from new facts and new investigations. The necessity for continuous revision and re-trial of hypotheses is nowhere so apparent as in education. To return to the illustration of the development of a spelling conscience, one conclusion may have been reached in an investigation of this subject in 1920. In 1934, however, a very different conclusion might be attained if the knowledge which had accumulated during the intervening period were brought to bear in the modification of the hypotheses that are tried out. One characteristic of the scientific procedure is that it never seems to be completely finished. Problems lead on to new problems, efforts to solve the new problems throw new light upon the solutions of the older problems, and they open up again. The cycle of the steps continues indefinitely: discovery of problem, collection of facts, arrayal of hypotheses, adoption of criteria, trial of hypotheses, interpretation and generalization, revision and re-trial, re-statement of problem, collection of facts, etc., etc. The implication is that experimental studies should be repeated until conclusions that are certain have been reached.

Possibilities and Limitations of Scientific Method in Supervision

How large a place should be occupied by scientific method in the work of the supervisor? One answer cannot be made for all supervisors under all conditions. The duties and responsibilities of supervisors differ in different communities. Their training and experience with scientific procedure are not the same; the time which they have available for such activities may be greatly limited; finally, there are decided differences in temperament among supervisors. Some who are of the executive type prefer

to make speedy decisions on the basis of such evidence as is readily available without the necessity of collecting other facts over a long period of time. Other supervisors, who have the temperament sometimes associated with artists, find it difficult or impossible for them to proceed systematically and logically in the collection and organization of data for the purpose of solving some supervisory problem. There remain, however, a large number of supervisors who are prepared and willing to use the scientific method in their regular work just as far as possible. For this group some observations regarding the place of the scientific method in supervision may be of service.

The only way to truth. If the way of revelation, which is very important in the religious world, is barred, there is no other road to truth than scientific method. The attainment of knowledge, and, through knowledge, of control over the conditions of life and of education, comes only through a more or less perfect application of the scientific procedure. Bias may be shown, only a few or the less important hypotheses may be arrayed, but in any event the scientific procedure is the only one available. The problem is not whether we shall use the scientific method in supervision but how well we shall use it.

Relation between scientific supervision and coöperative and creative supervision. In no sense is scientific supervision to be thought of as in opposition to coöperative and creative supervision. They are rather to be considered complementary factors in the total situation. This is clearly indicated in the Sixth Yearbook:[10]

> How may we secure that coöperation which makes for effectiveness in action and yet preserves variation in thinking and practice? How may we safeguard individuality, insure intellectual integrity, provide new ideas for reconstructing our beliefs, plans, and procedures, and yet maintain that degree of harmony necessary to group living and group work?
>
> The answer here would seem to lie in the widespread adoption of the democratic spirit and the scientific attitude broadly conceived. These two terms are purposely joined. At base they are one, for democracy implies "fair dealing with all peoples concerned," while the scientific attitude means "fair dealing with all the pertinent facts."

[10] *Effective Instructional Leadership,* Sixth Yearbook, Department of Supervisors and Directors of Instruction, N. E. A., p. 98. New York: Teachers College, Columbia University, 1933.

Usefulness in every aspect of supervision. Whatever the problem that confronts the supervisor, the scientific procedure may be used to a degree, at least, in its solution. Perhaps the problem is the adoption of a textbook. Assuredly this problem calls for careful collection of the relevant facts regarding the competing books. It suggests the need for a considered formulation of the criteria for the selection of the best textbook. It involves the description and measurement of all the effects of the use of each book as far as they can be estimated. Similar statements might be made about problems in any of the major divisions of supervision.

The limitation of time. In all probability many supervisors are deterred from the use of scientific procedure in their work more by the fact that their time is limited than for any other reason. It is true enough that the complete application of the scientific method to a problem requires a very considerable amount of time. Supervisors generally have many duties and responsibilities. What is the supervisor to do in this situation? Perhaps the best answer is that his program will include several different levels and types of the use of scientific method. He may and probably should carry on one or two major problems in as thoroughgoing a fashion as possible. By so doing, he keeps himself intelligently informed regarding the detailed procedures of science. He thus makes it easier for himself to interpret understandingly the products of the investigations made by others. There is further value in the findings themselves.

In addition to such intensive studies, the supervisor may share in the initiation by a group of teachers of certain other activities which may be carried on in accordance with the tenets of the scientific procedure but without such rigid adherence to the rules of scientific action as is implied in his own experimentation. He may then give guidance and assistance to the group carrying out this enterprise.

A third way in which the typical supervisor may utilize the scientific procedure is by his adoption for himself in all his professional work of the basic principles and characteristics of the scientific method. Even though one may not be able to carry on

a number of elaborate and technical investigations, yet he may meet each problem situation as it arises in his work with the typical characteristics of scientific procedure which have been outlined earlier in this chapter. Thus he may adopt as principles of his own conduct in educational situations the following: that decision shall be based upon facts rather than mere opinions, that the facts shall be described quantitatively wherever possible, that judgment shall be suspended as long as possible in order to insure the consideration of many facts and interpretations before the decision is made, that all of the facts shall be considered as far as they may be ascertained, that every step of the process shall be critically appraised, and so on.

Unavailability of some measuring instruments. Another limitation upon the use of the scientific procedure by the supervisor is the fact that measuring instruments for certain outcomes of instruction which he values highly are not yet devised, and others which have been devised are not yet perfected for use in typical schools by typical teachers. Remarkable progress has been made in the field of measurement, especially in the measurement of the so-called imponderables, during the last ten years, and no one is justified in saying that character qualities and emotional outcomes cannot be measured. They *can* be measured; many of them already have been measured. But the fact remains that many others have not yet yielded to experimental attack. Emphasis has been placed throughout this discussion upon the importance of securing evidence regarding all associated outcomes of different hypotheses which are being tried. The fact that measuring instruments are not readily available for all such outcomes, although certainly a limitation, is one which grows less and less serious each year as new devices are developed.

Scientific procedure vital to good supervision. The conclusion is that good supervision entails the use of the scientific method to an ever increasing degree. The potentialities far outweigh the limitations. Progress in supervision, and in the general attitude toward supervision, will come as supervisors possess the scientific attitude and meet their problems by the application of the principles of scientific procedure.

CHAPTER II

THE NATURE AND FUNCTIONS OF SUPERVISION

BEFORE YOU READ THE CHAPTER. Persons who join the Department of Supervisors and Directors of Instruction do so because they are interested in supervision. They wish to have periodically a restatement of the essential nature of supervision and the major functions to be exercised. This chapter is designed to provide such a statement with particular reference to the place of scientific method in supervision.

The aim of this chapter is to set forth the purpose and functions of supervision. Consideration is given especially to the modern concept of supervision as used in this yearbook. Other concepts of supervision[1] might be considered with interest, but such treatment would in no sense further the purposes of the committee responsible for the yearbook.

A discussion of instructional supervision is timely for the reason that at no previous period in our history has supervision in public schools been so vigorously questioned. Boards of Education, taxpayers' leagues, and mayors' commissions have attempted to weigh the values of supervision to determine, if possible, whether it shall be considered an indispensable element in the learning-teaching process or merely as an educational luxury.

Supervision has been a fertile field for research in the past, but many problems still remain unsolved, especially in the use of scientific methods. At a time when scientific supervision is greatly needed, lay support of supervision is lacking. It is therefore imperative that students of scientific methods in education provide the answers to the questions: Is supervision necessary? What are the functions of supervision? How can supervision be carried on scientifically?

[1] For a full discussion of the changing conceptions of supervision, see Brim, O. G., "Changing and Conflicting Conceptions in Supervision." *Educational Method*, X (October, 1930), 131-140.

Nature of Supervision

Modern conception of supervision. The answers to these questions must be evaluated in terms of one's educational philosophy, and especially in terms of the goals which one accepts. Two influences have been at work since the beginning of the twentieth century which have caused changes in the point of view of supervision. One is the so-called Dewey philosophy; the other is the development and use of the scientific method as applied to education. These two influences have brought about a new formulation of the goals of education, the purposes to be served in the teaching process, and the procedures by which these goals and purposes are to be realized.

Formerly the act of supervision was focused on the teacher. His personality, dress, state of health, position before the class, and the like were scrutinized closely by the supervisor. The good was often commended, the bad condemned, and much advice gratuitously dispensed. The use of scientific techniques in supervision has resulted in the shifting of the focus of supervisory attention from the teacher to the pupil. The supervisor may still observe the teacher in teaching, but his attention is fixed on the acts of the teacher not as ends but as means which affect the pupil. He studies the performance of the pupil as a means of appraising the learning. Teaching activities are studied chiefly in the light of their effect on the learner. The immediate concern of the supervisor is often to produce change in the activities of the teacher which will result in the professional growth of the teacher; the ultimate purpose of the supervisor, however, is to produce the largest amount of desirable growth in the pupils under the guidance of the teacher. The all-inclusive purpose of supervision then becomes "pupil growth through teacher growth."

The foregoing generalization directs attention to the only justification for supervision, namely, providing for the growth and improvement of teachers as a means of insuring the growth and development of pupils. Communities which are deeply concerned about the progress of their children in school seldom are

willing to curtail supervision which promotes pupil growth, even when faced with drastic budget retrenchments.

Meaning of pupil growth and teacher growth. Pupil growth means the growth of the whole pupil—growth of his physical body, growth in his control over knowledges and skills, growth in his emotional balance and adjustment. No one of these alone is an adequate statement of the goal which is sought in pupil development. Furthermore, the concept of pupil growth implies consideration in the supervisory program to the end that the pupil may receive the very best that the entire school has to offer. By "entire school" is meant not only the school plant with its staff, equipment, curricula, and activities, but also the school community.

Teacher growth means similarly a growth in every phase of the teacher's life and activities which can influence pupil development. In general, the supervisory officer assumes the responsibility for helping the teacher to help himself in "the formation of ever more worthy purposes, the ever more efficient achievement of purposes, and the ever more harmonious organization of thought, feelings, and emotions in terms of enduring purposes"—this, with the hope that the teacher will in turn help the pupil to the same desired end.

Major characteristics of supervision. The concept of supervision thus far presented is intended to be in agreement with the statement in the Third Yearbook of the Department of Supervisors and Directors of Instruction, which follows:

1. *Supervision is philosophic:* (a) Supervision seeks the truth. (b) It keeps abreast of the leading movements in education.
2. *Supervision is coöperative:* (a) All supervisory agents work toward common ends. This implies that common ends have been determined through the refinement which comes only with the conflict of minds. (b) Supervision works with teachers toward the solution of mutual problems. This involves the creation of situations in which teachers become aware of their problems and seek assistance in their solution.
3. *Supervision is creative:* (a) Supervision seeks latent talents. It draws out the best in everyone it meets. (b) Supervision creates environment. It seeks a nice balance between the best development of the individual and the greatest good of the social group in which he develops.
4. *Supervision is scientific:* (a) Supervision applies the scientific method

to its study of the teaching process. It stimulates constructive critical thinking. (b) Supervision seeks proof as to its own accomplishments. It seeks to improve its measure of the individual and of the group. (c) Supervision encourages experimentation under proper controls.

5. *Supervision is effective:* (a) Supervision helps teachers secure an effective working knowledge of the tools of teaching, the courses of study, standard tests, books, instructional materials, equipments, and beyond this it seeks to improve the tools themselves. (b) Supervision coordinates theory and practice. It realizes that theory must square with fact.[2]

Effect of modern concept of supervision on teaching. Teachers working with their supervisors under these principles materially improve the use of their professional texts, research bulletins, periodicals, conferences, observations, self-rating, and inter-class visitation. They improve their own social environment and that of their pupils, and work with their supervisors as their pupils work with them. The teachers are aroused to a real desire to find in their own work promising situations and desirable techniques through which they may do creative teaching. Thus stimulated and guided, teachers deepen their philosophy, seek new and more concrete aims, enrich the curricula, develop more workable lesson plans and methods, create larger units of work with more pertinent, coördinated sub-units; and re-create their concepts of assignments and questions as a challenge to pupil thinking. The subjects of the curriculum are merged, and there is more integration without loss of specific subject matter. Objective standards are set up for pupil and teacher accomplishment. The teachers recognize that "failure" is the failure of the school rather than the failure of the child. They re-create their own classroom and school environment and build stronger pupil and professional morale. They reach out into the homes and they not only enlist the support of the parents but actually achieve a desirable type of adult education.

Perhaps, best of all, these teachers *learn the science and art of self-supervision.* Pupils learn to direct their own activities. They maintain an unprecedented record of non-tardiness, attendance, deportment, and volunteer school activity during, before, and

[2] Adapted from the Third Yearbook of the Department of Supervisors and Directors of Instruction, *Current Problems of Supervisors*, p. 8-9. New York: Teachers College, Columbia University, 1930.

after school hours; and they attain high scholarship records. Their active interests reach out into the community and tie up specifically with national and world problems.

The Functions of Supervision—Prior Statements

A review of the literature dealing with supervision shows that there is by no means complete uniformity of belief concerning the nature and functions of supervision or the duties of a supervisory officer. However, in much of the recent literature one finds more or less agreement on the fundamental principles underlying the place of supervision in an educational program. The yearbooks published by those departments which are concerned with supervision show that the duties of supervisors may be classified under several functions more or less common in all classifications.

Spain's classification. In the First Yearbook of our Department, Spain[a] says that the functions of the supervisor may be classified in order of their importance as: (1) research, (2) training, and (3) field work. Under each of these functions he lists several duties or forms of procedure:

Research

1. Tries to discover existing defects in instruction.
2. Seeks to find either in his own system or elsewhere improved methods for the correction of defects.
3. Formulates a tentative plan for the improvement of instruction.
4. Tries the plan under controlled experimental conditions.
5. Measures the results of the experiment.
6. Formulates tentative objectives and standards.
7. Formulates a plan for the general use of the method.
8. Presents the plan to district principals for criticism, suggestion, and approval.

Training

1. Conferences with district principals, principals, or teachers.
2. Visits to schools for demonstration, instruction, or diagnosis.
3. Meetings with district principals, principals, or teachers for demonstration lessons or discussions.
4. Distribution of bulletins on instruction, type lessons, references for study or reading, and similar aids.

[a] Spain, Charles L., "The Detroit Plan of Supervision," *Educational Supervision*, First Yearbook of the National Conference on Educational Method, p. 82-85. New York: Teachers College, Columbia University, 1928.

5. Organization of extension classes open to district principals, principals, and teachers.

Field Work

Under the plan here outlined a supervisor's visits to schools are of two types. From time to time he visits on his own initiative for the purpose of becoming familiar with existing conditions in his field. A progressive supervisor must keep himself informed. At the time of such visits he may comment on the work of teachers, but he must bear in mind the fact that the principal, not the supervisor, is responsible for the quality of instruction of individual teachers. Therefore, such comments as the supervisor makes should be in the presence of the principal or with his knowledge. All other visits made by the supervisor are on request from the principal.

Eighth Yearbook classification. In the Eighth Yearbook[4] of the Department of Superintendence, the Commission on Supervision grouped the functions of supervision under the following captions: (1) inspection, (2) research, (3) training, and (4) guidance. Under each of these divisions the Commission lists several duties or forms of procedure:

Inspection

By inspection is meant the survey of classroom teaching and the school system as a whole, the equipment, the means of instruction, the service, the personnel, the pupils, or any other items of detail, to ascertain how efficiently instruction is being given. The means of securing information may be by visit, by general report, or by measurement. Detailed information relative to present attainments is essential to future progress.

Research

Research is a systematic critical investigation seeking facts or principles. Its purpose is to discover, clarify, and isolate problems; to collect, organize, and interpret facts; to formulate hypotheses, and to test them and appraise their value.

Training

In practice, training may take the form of: (1) conferences with individual teachers during which there is free interchange of ideas and analysis of individual problems; (2) meetings with experimental groups of teachers selected for their creative ability; (3) group meetings of teachers for the observation and discussion of demonstration lessons in which the ideas of the supervisory agent are exemplified under practical conditions; (4) visits to classrooms, preferably on invitation, for the purpose of diagnosing difficulties, making suggestions,

[4] *The Superintendent Surveys Supervision*, Eighth Yearbook, Department of Superintendence, National Education Association, Washington, D. C., 1930, p. 14-18.

or giving instruction through demonstration. The ideal supervisory agent visits teachers avowedly as a service agent, ready to aid, to guide, and encourage, rather than as one who comes to criticize, to censure, and perhaps to rate; (5) the distribution of instructional aids, such as bulletins, type lessons, and references for reading and study; (6) the organization of extension classes to supplement other training procedures.

Guidance

In the performance of this function, the person in charge supplements a teacher's previous training: (1) by providing him with special information relating to his immediate problems; (2) by furnishing him suitable materials for instruction; (3) by helping him to measure the achievement of his pupils, to diagnose their difficulties, and to apply suitable remedies; (4) by supplying standards by which he can judge his own efficiency; (5) by diagnosing his failures; (6) by suggesting remedial measures; (7) by appraising his final success or failure. The exercise of the guidance function is necessary if the teacher in the classroom is to attain and hold the advanced ground for which research and training have paved the way.

Hamtramck outline. School systems have attempted to set up policies which will show the general supervisory duties of instructional supervisors. An illustration of this type may be taken from the *Public School Code* of the Hamtramck, Michigan, Public Schools.[5]

The work of the instructional specialists shall consist of three types of activities: (1) approximately one-third of their time shall be devoted to research; (2) approximately one-third to the development of practical techniques from the results of research; and (3) approximately one-third to assisting, upon call, field agents who are using these products of research. The director of instruction has no responsibility for the work of any teacher, nor is he directly concerned with the appraisal of the teacher's or principal's work. His primary function is to create new and more efficient methods of instruction. In more detail this means that a director of instruction is responsible in his field for:

1. Discovering, formulating, and solving all instructional problems.
2. Constructing the course of study.
3. Devising, testing, and selecting methods of teaching.
4. Formulating tests and methods of measuring the efficiency of instruction.
5. Determining the degree of efficiency to be adopted as standard.
6. Formulating standards of equipment, supplies, and organization.
7. Formulating methods of diagnosis and methods of remedying specific defects.

[5] *Public School Code.* Hamtramck, Michigan: Board of Education, 1927, p. 142-143.

8. Rendering assistance "upon call," i. e., when and where requested to do so.
9. Doing such experimental and pure research work as may be necessary for the ultimate improvement of instruction.
10. Searching for "high spots" in his own and other school systems and from other sources; digesting reports of "low spots" and "high spots" from his own and other school systems; formulating items of value for transmission to the system, and presenting the same to the administrative officers.
11. Appraising the instructional effects of the work of other departments and making suggestions to the Superintendent for the improvement of the work of other departments as it affects his own specific work.

Studies of duties of supervisors. A number of studies have been made to show the duties performed by supervisory officers. These studies[6] include the duties of superintendents, special supervisors, and principals. An analysis of the data thus collected reveals that it is somewhat difficult to classify all the duties performed by supervisors under the headings given in the references.

For example, Barr shows that a part of the time of special supervisors is spent with outside agencies. In fact, in one study reported in the Eighth Yearbook of the Department of Superintendence, he shows that approximately four per cent of the supervisor's time is thus spent. On close analysis of the data presented in Barr's studies, one finds that many of the other activities which he reports could be classified under "public relations." Among those listed by Barr are the following: (1) answering requests for assistance from the community, (2) attending numerous community meetings, (3) addressing community groups, (4) participating in the civic, social, and educational affairs of the community, (5) preparing articles for newspapers, (6) preparing educational exhibits, and (7) preparing parent-teacher programs.

The Department of Elementary School Principals of the National Education Association has published one yearbook devoted entirely to *The Principal and His Community.*[7] The activities discussed in that yearbook apply in a large measure to all persons

[6] Department of Superintendence, Eighth Yearbook, p. 19-49.
[7] *The Principal and His Community,* Eleventh Yearbook, Department of Elementary Principals, N. E. A., Washington, D. C., 1931, p. 45-47.

serving in a supervisory capacity, whether principals, superintendents, supervisors, or department heads in a school. The scope of these activities may be seen from the titles of some of the chapters of that yearbook: Surveys of the Community, Home Contacts Sought by the School, The Parent-Teacher Movement, Community Center Activities, School Publicity, Service Clubs, Social and Welfare Agencies, Excursions and Exhibits, and Governmental Agencies.

Other studies of duties of supervisors use the approach of the attitudes expressed by teachers toward supervision and the needs for aid which are revealed by teachers. Thus, an investigation[8] of the views of teachers and supervisors with respect to the techniques employed in supervision reveals many conflicting attitudes which make for difficulties in supervision and render the realization of its purposes well-nigh impossible. If we accept the dictum that a feeling of mutuality between supervisors and teachers is essential to effective supervision, then the remedy for the condition lies in the development of the scientific attitude toward supervision during the period of initial training.

Other evidence indicates that the needs of teachers are varied and that they desire specific assistance through supervision which may not always be readily supplied by the supervisor. The inability of the supervisor to supply promptly the type of supervisory assistance desired by a teacher may result in loss of confidence in supervision. Data collected from 1,000 secondary-school teachers regarding the supervisory assistance desired but not received show that supervisors should ascertain the views of teachers regarding needs in the development of supervisory programs. The following list[9] gives the percentage of secondary school teachers indicating the specific types of supervisory assistance desired but not received from their supervisors:

Number of cases	1,000
Per cent not specifying any need	23.4
Per cent specifying each of the following needs:	

[8] Frederick, R. W., and Halter, Helen, "Conflicting Attitudes Toward Supervision," *Educational Administration and Supervision*, XIX (April, 1933), 307-314.

[9] Taken from data reported in *Bulletin No. 37*, Department of Secondary School Principals, N. E. A., Washington, D. C., 1931, p. 45-47.

1. Permission to visit other teachers whose work is considered superior	21.6
2. Diagnosis of deficiencies and faults in teaching and remedies suggested	18.5
3. Frequent personal conferences regarding work	14.3
4. Factual data regarding scientific experiments in the teacher's field of work	10.3
5. Commendation for work better than average	9.5
6. Frequent demonstration teaching	7.6
7. Assistance in the management of problem pupils	6.4
8. Assistance in construction of tests	5.6
9. Assistance in preparation of lesson plans	3.5
10. Tested formulas for meeting every kind of teaching difficulty	2.7

Six Major Functions of Supervision

Analysis of the duties performed by supervisors as revealed in the published studies shows that the duties can be classified under six major functions: (1) study of the pupil, (2) training of teachers, (3) conduct of curriculum investigations, (4) preparation and installation of courses of study, (5) selection of textbooks and preparation of materials of instruction, and (6) conduct of a public relations program. This is the classification followed in the organization of the present yearbook.

Study of the pupil. The pupil is the most important individual in the educational scheme. For him the philosophies of education have been formulated and means for achieving the goals of education set up. It is therefore essential that a many-sided study of him and his needs be made. Before the supervisor can prepare a program for helping the teacher help the pupil, he must know a great deal about the pupil himself. To know a pupil the supervisor should study his physical, social, mental, and emotional make-up.

On the physical side the supervisor should know something of the differences among pupils as related to their age, rate of growth, handicaps, and any biological characteristics which make one individual different from another. On the social side the supervisor should know something of the sociological characteristics that make one individual different from another. He should know the social background of the pupils, their special

community interests, the games which they enjoy at different ages, the way in which they spend their leisure time, and the ability which each has to get along with his fellows. On the mental or intellectual side the supervisor should know something of the psychological factors which help to make the pupil an individual. Furthermore, he should inform himself concerning the attainments of the pupil in the intellectual aspects of school work, including reading, arithmetic, and similar school subjects. On the emotional side the supervisor should study such characteristics as those listed by Wickman.[10]

Training of teachers. Nearly every grouping which can be made of the functions of supervisors shows that considerable attention is given to teacher-training activities. These activities must be carried on in the light of the needs of the teacher. The teacher is universally recognized as the agent who brings the curriculum and the pupil together. Growth of both teacher and pupil can be insured only when the working relationships of these two have been adjusted to meet the peculiarities of each. The supervisor should be acquainted with the characteristics of the individual teachers; he should know something of the training which they have had for their task, something of their general concept of the purpose of education; and he should know a great deal about the idiosyncrasies of the individual teachers. Accordingly his program should be adapted to meet the individual needs of each teacher. He should attempt to build upon the strengths of each individual as well as upon the strong teachers in the system. He should respect the personality of the teacher to the same degree that he expects the teacher to respect the personality of the pupils. Whether the supervisor will deal only in cold logic and collect only data bearing upon intellectual factors in the situation or will recognize also the more subtle and somewhat intangible bases that so largely affect the teacher's success will determine to a considerable extent the effectiveness with which the supervisor applies science to his whole task of promoting teacher and pupil growth.

[10] Wickman, E. K., *Children's Behavior and Teachers' Attitudes.* New York: The Commonwealth Fund, 1928.

Next in importance to personality traits is the teacher's philosophy of life and his philosophy of education. A supervisor cannot give a philosophy, but he may help the teacher formulate a philosophy of his own. The supervisor may not necessarily ask the teacher to adopt any one philosophy, but should help him to build a workable one to be used in the schoolroom which will aid boys and girls to grow in the direction of the desired goals. Herein lies a difficult but fertile field of supervision. The supervision of methods, an important function, is greatly facilitated by a knowledge of the teacher's personality and philosophy. Scientific procedure calls for an analysis and use of all the elements that go into the making of a successful teacher.

Conduct of curriculum investigations. Supervisors should be constantly making a study of the requirements of the curriculum in the school system. These needs may be classified under three headings: (1) selection of experiences, (2) grade placement of experiences, and (3) methods of presenting and guiding experiences. In order to deal with these matters satisfactorily, the supervisor should have a knowledge of the sociological factors that are at work in the community and he should have a knowledge of the psychological factors which influence the learning of the pupils. Moreover, the supervisor should have an open mind regarding the present organization of curriculum practices. He should be conscious of the doubtful value of blocks or compartments of the curriculum caused by either vertical or horizontal divisions. He should be equally conscious of the unproved value of other suggested procedures. On one hand he will hear the proponents of a formal organization say that the pupil grows best by working in water-tight compartments, such as fifth grade reading, ninth grade history, twelfth grade English. On the other hand, he will hear the proponents of a different plan propose that the schools should offer experiences for pupils whereby subject matter will become a tool to be used in providing experiences for pupils at the time when they need it. Under this second plan the task of the teacher is to make the experience most worth while to the pupils, to help them to integrate the different experiences, and to use the various phases

of these experiences in integrating their own personalities. Thus the supervisor should collect evidence on all phases of the curriculum which will help to provide activities most worth while in promoting pupil growth.

Preparation and installation of courses of study. The task of the supervisor is to harmonize the two points of view expressed in the preceding paragraph. He should use the contributions from every field of thought and any additional evidence of a scientific nature which may be secured to answer the question of what procedure is best to achieve the purposes which he hopes to achieve. He should make his findings available to the teachers in the form most usable to them. Only by trial and evaluation can he know the degree to which he has succeeded.

Selection of textbooks and preparation of materials of instruction. Textbooks and materials which are supplied to the pupils are generally considered next to the teacher in importance in the learning situation. Understanding the art and science that go into the making of instructional materials facilitates supervision and teaching. The supervisor should help teachers understand textbook construction and give the teacher some basis for selecting reference materials in the light of classroom needs. Furthermore, the supervisor should assist the teacher in the preparation of materials to meet the needs of individual pupils. This can be done by setting up certain standards to be considered in writing up units of work by providing means for evaluating them through a try-out in the classroom.

Conduct of a public relations program. Public relations are commonly thought of as a function of administration. It is true that the major responsibility for public relations resides in the superintendent of schools, and that he must decide as to the general nature of the program. Nevertheless, the supervisory officer, working under the direction of the superintendent, has certain obligations in this regard. He knows the instructional program and must share in the responsibility for having it understood and appreciated by the parents and the community at large. Furthermore, if he is to keep the instruction in the schools attuned to the changing needs of society generally, and of the local

community in particular, he must carry on a continuing study of community life and interests and needs.

A public relations program is in reality a program of social engineering. Judd, in speaking of the relation of the principal to the community says, "The day will come when the public will learn that a human engineer in charge of a school is a person occupied with investigations that increase the efficiency of schools to such an extent that it is uneconomical for him to be disturbed every few minutes on the telephone or by personal callers."[11]

Kline says, "Today the principal is more than an administrator. He is the social engineer of his district. He must be able to discover the forces for good or evil which influence the educational activities of his school. He must be able to interpret his philosophy of education, as well as the program of the school to all citizens."[12]

A program of public relations calls for a policy that shall result in unity of purpose of all people in the community but not necessarily uniformity of practice among the various community organizations. In trying to carry out a program of public relations the supervisor should discover what the people in the community think. He should be concerned not only with what they think of the schools but also with what they think regarding all major social problems. He should become acquainted with the varied philosophies, ideals, and procedures expressed in the different organizations and agencies in the community. Unless the supervisor knows the truth about the attitude of the various members of the community toward social problems, he is handicapped in setting up a program for the schools. As in all other phases of his work, the supervisor should attack the problem of public relations with a scientific attitude. After he has collected the facts, he should weigh their relative value in the light of needs and then proceed to invent ways and means for utilizing them to their maximum. Programs that utilize the community contributions for pupil achievement should be prepared and

[11] *The Principal and Administration,* Ninth Yearbook, Department of Elementary School Principals, N. E. A., Washington, D. C., 1930, p. 171.

[12] *The Principal and Supervision,* Tenth Yearbook, Department of Elementary School Principals, N. E. A., Washington, D. C., 1931, p. 133.

executed. Their execution may be carried on through agencies other than the schools. These agencies will include varied organizations, such as clinics, dispensaries, boys' and girls' clubs, libraries, adult clubs, churches, and the home. Thus there can be a unification of all social forces for the benefit of each individual in the community.

Summary

The supervisor as a leader in scientific supervision. The place of the supervisor in supervision is obviously one of leadership. If the character of this leadership is to be scientific, the leader must be critical of his methods. He must evaluate results carefully, impartially, and impersonally, and must accept responsibility for their character jointly with the teachers. This distribution of responsibility for results becomes the basis of cooperative relations between supervisors and teachers in the mutual task of improving the quality of education in any given school. Without it, supervision tends to become mere inspection, and its scientific value is lost.

The supervisor as a leader must find the situations in the work of the teachers which will enable him to create and utilize the elements of professional growth. The problem of the teacher under the guidance of the supervisor becomes a challenge to improvement. It also serves as the occasion out of which inevitably develops the feeling of mutuality so essential to progress in supervision. Personal issues are thus submerged and the relationship established by the supervisor with the teacher becomes one of mutual coöperation.

Relation of supervision to the development of the scientific attitude toward learning and teaching. Improvement in learning in a school depends very largely on the attitudes of the teachers toward classroom work. If their attitudes are uncritical or indifferent with respect to the learning of their pupils, supervision will have little effect until these attitudes are changed. It therefore becomes a major purpose of supervision to create a scientific attitude on the part of teachers toward learning and teaching. This cannot be done merely through introducing teachers to the

instruments of scientific measurement. They must be instructed in the use of such instruments and must be led to interpret measurements, to analyze results, and to seek explanations for the character of results. Supervision which stops short of analysis, comparison, and correct interpretation of scientific measurements of classroom work fails in its function. To be scientific it must challenge the teachers to find valid explanations for their facts.

Functions of scientific supervision applied. In subsequent chapters of this yearbook, consideration is given to specific functions of scientific supervision, such as the use of scientific method in the appraisal of instruction, in the promotion of teacher growth, in the improvement of curriculum materials, in the preparation of courses of study, and in the preparation of instructional materials. The realization of any or all of these specific functions is contingent upon the development of the scientific attitude toward learning and teaching on the part of the staff. The ease or difficulty with which this major purpose of supervision is realized for a staff depends in part on the organization for supervision in any given school system—a problem considered in the following chapter.

CHAPTER III

HOW TO USE THE SCIENTIFIC METHOD IN THE ORGANIZATION OF SUPERVISION

BEFORE YOU READ THE CHAPTER. The Sixth Yearbook of the Department[1] dealt particularly with the organization of supervisory agents to provide effective instructional leadership. This chapter of this yearbook presents a brief statement of the same general subject, but emphasizes two lines of approach to the use of the scientific method in connection with organization. The first section suggests how the superintendent may use the method of science in deciding upon the supervisory staff that is needed, the allocation of responsibilities among the staff members, and the provisions for coördination of their activities. The second section discusses the organization of supervisory activities which seems most likely to promote the use of the scientific procedure in every phase of supervision.

Progress in supervision depends very largely on the methods employed. As a result methods in supervision have undergone a rapid development, especially in recent years. The methods have tended to become scientific, and their use has become an important responsibility of officers charged with the task of organizing programs of supervision in public and private schools. The continued use by a supervisor of a faulty method in supervision is, therefore, more than a negative act. It is a positive wrong on the part of the individual concerned and is *prima facie* evidence of incompetence on the part of the officials of the school system directly responsible for the program under which the act is performed.

Since administrative officers must justify their programs of supervision in the light of the methods employed by supervisory officers, a consideration of scientific methods becomes an important phase of the program of supervision in any system of schools. How to organize the program is the problem of the administrative

[1] *Effective Instructional Leadership*, Sixth Yearbook, Department of Supervisors and Directors of Instruction, N. E. A. New York: Teachers College, Columbia University, 1933.

officer; how to execute the program is the responsibility of the individuals charged with supervisory functions.

Steps in Organization for Scientific Supervision

Survey of needs. The initial step in the development of a program of supervision consists in the collection of factual material which will serve as the basis in ascertaining the needs for supervision in the school system in question. Factual information bearing on the attention and application of pupils, favored types of teaching used by teachers, skill and resourcefulness of teachers in the preparation and use of teaching materials, attention of teachers to the details of classroom business, etc., may be secured through systematic sampling of classroom work through visitation by both administrative and supervisory officers, through conferences with teachers, and through the use of objective tests. Without adequate survey data on classroom work, a program of scientific supervision designed to meet the needs of the school system in question cannot be projected.

Analysis of survey data. Of course, the mere collection of information by the methods indicated does not insure the scientific formulation of a supervisory program. The data must be carefully analyzed to determine the character of the learning and teaching. Faulty learning may be due to faulty teaching. Indeed, the method of the learning is fully as important as the matter learned. The purpose of analysis is to ascertain both the "how" and the "what" in learning, and the analysis is not considered adequate unless it brings to light the methods of both the teaching and the learning.

Formulation of program. The identification of the problems of learning and teaching in the different classrooms of a given system of schools makes possible the formulation of a supervisory program to deal with the problems requiring supervision. Corrective or remedial measures may be planned or compensatory measures developed in the light of the findings of the survey data and the subsequent analysis. Definite supervisory duties may then be allocated to the members of the supervisory staff and the strength of the school system utilized in meeting the needs which

require supervisory attention. In brief, a program of supervision can be planned if the needs are apparent.

Refined study of specific needs. In the supervisory program provision must be made for refined measurement as a means of making possible the diagnosis of specific needs in different classrooms and in different subjects calling for supervisory attention. Qualitative methods involving the use of analytical score cards and quality scales can be employed in making specific diagnoses, or quantitative methods involving the use of objective tests can be resorted to. In either instance the method of science can be utilized in the execution of the supervisory program.

Execution of program. The organization of a program of supervision is an important achievement for a school system, whether it be planned for a single school, a city system, a county, or state system; however, the value of the program to the schools for which it is planned depends largely on the character of its execution. The officer who projects the program in accordance with the foregoing steps has removed the chief barrier to successful supervision. Assuming that an administrative officer or supervisor capable of planning a supervisory program is also conversant with scientific technique, the character of the execution will be conditioned by factors, such as the time available for supervision, the ability of the school system to supply the materials needed in executing the program, and the extent of the need for supervision on the part of the teaching staff.

Many minor problems in the execution of the supervisory program will be determined by the unit or area to be supervised, but the major problems involving scientific procedures will be approximately the same irrespective of whether the unit is a single school with only a few teachers or an entire state. Consequently, the understanding and use of scientific methods becomes an important problem in the execution of a supervisory program.

Evaluation of supervision. The final step in the program calls for an evaluation of the supervisory effort made in undertaking to solve the problems selected for supervision. Results accomplished for the pupils must always be the final measure of supervisory efficiency, although improvement in the craftsmanship of

the teachers may be considered a by-product of no mean value. The cost of supervision must be justified by some tangible results, if continued support of its programs is to be expected. Supervision presents no greater challenge to administrative officers and supervisors than that of scientifically appraising its results.

Conditions Essential to Proper Organization

Supervision as a function of administration. The need for supervision was an important factor in the rise and development of professionally trained officers of administration in public schools. Supervision, therefore, became one of the important functions of administration. Administrative officers fail or succeed in their positions largely on the character of supervision they are able to provide. In small school systems administrative officers are frequently expected to provide personally all the supervision for their schools. In city school systems of medium and large size the chief administrative officer is usually provided with a supervisory staff to carry on the supervisory activities formulated by the administrative head. However, this official is just as truly responsible for the results of supervision in his school system as the superintendent of the small city system who both formulates and executes his supervisory program. Supervision is therefore conceived as that function of school administration which seeks both by direct and indirect means to improve the character of learning and teaching in the schools.

Organization of teaching staff for professional training through supervision. The in-service improvement of the teaching staff of a school system is a major function of supervision. To this end the staff must be fully informed regarding the purpose of supervision and the means by which it will be carried on. Since the members of the staff will profit personally from successful supervision, as well as the pupils under their charge, it is essential that a feeling of mutuality on the part of supervisors and persons supervised be developed. Furthermore, the supervisory staff will also grow through their relations with the teachers.

General faculty meetings. The means most frequently used to acquaint staff members with the nature of the supervisory pro-

gram and to develop a wholesome attitude toward supervisory activities is the general faculty meeting. The divergent needs of faculty members for specific assistance through supervision render virtually impossible the consideration of specific problems of teaching in general meetings. These meetings should be devoted to general problems and matters of common interest to the members of the staff. The supervisory program may be broadly outlined at such meetings, and matters considered which will lay the basis for specific activities in supervision of importance to individuals and departmental groups.

The general faculty meeting should result in the professional stimulation of the members of the staff. It may be used to orient individuals with respect to the purposes and the technique of supervision. General principles of teaching and the terminology of supervision may be considered, and the staff members prepared both in attitude and understanding for the specific problems in connection with which training is desired.

Group conferences. Through the use of group conferences the staff may be organized with respect to training for specific needs. These needs may have been identified through the survey appraisals as affecting teachers in subject fields, grade levels, or experience groups. The supervisory activity should be planned for the group in question and the specific need to be met. The advantage which group meetings possess in contrast with the general type rests on the specific motivation of the group to be trained and on the possible concentrated attack on the specific problem to be solved. The plan makes for continuity of training and affords the individuals concerned an opportunity to appraise frequently their professional growth and development.

Coöperating committees. The program of training through supervision should provide for coöperating committees of the teaching staff to work with the supervisors in the planning and execution of supervisory activities. The plan makes for mutuality of interest in supervision on the part of both the supervisors and supervised. Furthermore, it enables the supervised to contribute definitely to their own self-improvement.

For example, the appointment of a committee on research to

coöperate with a supervisory officer places the responsibility for collecting and disseminating information pertaining to certain supervisory activities on the groups interested in the specific problems involved in the activities in question. This function of the committee requires a careful examination and evaluation of research investigations bearing on the problems selected for study and the distribution of the findings to the members of the groups represented by the committee. Such service is important and it contributes much to the development of a favorable attitude toward the use of scientific methods in supervision.

The committee may be utilized in formulating problems for coöperative experimentation. Through direct experimentation the techniques of scientific methods are acquired by the members of the staff who participate. Non-participating members may be stimulated to study the experiments and the techniques involved as a result of contacts with the committee or with participating members. The purposes of supervision are consequently facilitated through the influence of the committee's participation.

The committees may also be employed in the selection of commercial instructional materials, such as basic textbooks, supplementary books, recreational reading, work books, films, slides, maps, apparatus, and classroom supplies; and also in the preparation of teaching materials, such as unit outlines, assimilation guide sheets, contracts, tests, and the like. Larger services may likewise be secured from coöperating committees in the reorganization of the course of study and in the revision of individual curriculums in subject matter fields.

Development of record forms. The use of scientific methods in supervision requires record forms for the collection of factual data on the problems selected for supervision. The practices of teachers must be recorded and the progress of pupils evaluated. Without recorded data the basis for supervisory conference is lacking. With such data results of specific procedures can be appraised and causes of failure or success in learning and teaching traced. The teachers supervised should be trained in the recording of important data regarding pupils, and the supervisor must likewise record significant data regarding the teachers.

Organization to Improve Qualitative Methods

Selection of problems for qualitative supervision. By qualitative supervision is meant those activities or processes carried out subjectively by the supervisor on the basis of data secured through personal impressions rather than refined numerical evaluation or computation. Many problems in supervision cannot be studied successfully by qualitative methods. These problems should be reserved for other methods and only those problems selected for qualitative study which can be dealt with subjectively. The persons supervised should be informed regarding the problems selected for supervisory study and the methods to be employed in the supervisory activities. Only by so doing can the confidence and respect of the supervised in qualitative methods be secured.

Organization of teaching staff to participate in qualitative supervision. Staff meetings will be required to acquaint the members with the criteria to be used in qualitative supervision. Through coöperation with committees of staff members qualitative scales may be developed for use in the appraisal of teaching activities selected for supervisory study. This method has been employed by Gray[2] in the qualitative appraisal of levels in reading, by Brueckner[3] in evaluating classroom procedure, and has been treated comprehensively in an earlier yearbook.[4]

The development of qualitative scales and the definition of criteria used in subjective evaluation make for common understanding of the problems selected for supervision and increase the accuracy of qualitative judgments. Furthermore, the scales and the criteria may be used in self-appraisal.

Record forms for collection of qualitative data. The value of qualitative appraisals in supervision is increased by the making of records at the time the appraisals are made. Such appraisals tend to become blurred by subsequent impressions unless records

[2] Gray, W. S., and Whipple, Gertrude, *Improving Instruction in Reading: An Experimental Study*. Department of Education, University of Chicago, 1933, Supplementary Educational Monographs, No. 40, p. 43-49.

[3] Brueckner, L. J., "Scales for the Rating of Teaching Skill," *Bulletin of the University of Minnesota*, XXX:12 (February, 1927), 28.

[4] *Scientific Method in Supervision*, Second Yearbook, National Conference of Supervisors and Directors of Instruction, p. 133-180. New York: Teachers College, Columbia University, 1929.

are made. The use of analytical score cards in qualitative supervision compels analysis at the moment of observation. If analysis is delayed the observer may subsequently analyze a general impression which tends to obscure the specific impressions of which it is composed. Such analysis is unreliable and tends to create disrespect for qualitative methods.

Recitation score cards, such as that developed by Giles,[5] require immediate analysis and appraisal of specific phases of procedure, which can be reconsidered later in relation to subsequent analyses and conclusions when complete evaluation of classroom procedure is made. The record enhances the value of the qualitative judgment for the reason that it renders possible the checking of analyses and the reconstruction of general impressions.

Organize to realize the supervisory outcomes desired through the limitations imposed by qualitative method. Since any qualitative judgment must necessarily be considered tentative in character, the supervisor must perfect an organization for the use of the method within its logical limitations. The visitation of classrooms to observe learning and teaching involves a large element of chance not subject to control. This element is minimized by the use of a method of science, namely, systematic sampling. Through this method analyses of procedures can be appraised and the problems of individual teachers identified.

A second method of science, namely, the case technique, can be applied after the findings of the sampling method have been evaluated. The case method enables the supervisor to collect data regarding a given case and to search for causes which need correction. The individual teacher is understood and the supervisory program applied in accordance with the specific needs of the case.

Both methods involve organization to secure the best results within the limitations which the methods impose. Provisions for recording data collected through sampling, the establishment of case files for the individual members of the staff, and the development of the supervisory program to use qualitative methods to the extent that such methods are practicable will enable supervisors to realize the desired objectives of qualitative supervision.

[5] Giles, J. T., *Recitation Score Card.* Yonkers, N. Y.: World Book Company, 1925.

Organization to Facilitate the Use of Quantitative Methods

Selection of problems for quantitative supervision. The term quantitative supervision is applied to those activities of the supervisor which can be characterized as objective, i. e., based on numerical data. The method can best be applied to the evaluation of the aspects of pupil progress which can be measured by objective methods. The problem for objective measurement may be selected through qualitative methods or through the use of quantitative surveys. When the problems are identified, objective tests may be selected or prepared for the purpose of making the measurement desired. On the basis of the findings diagnosis can be made, remedial or corrective measures employed, and the progress of the pupils objectively appraised with respect to the problems in question.

Organization of staff to deal with the problems selected for quantitative supervision. Staff members may be organized for general instruction in quantitative methods or for the study of specific problems. Both types of organization are probably necessary, although the latter is usually considered more important. If the staff is organized to study special problems by quantitative methods the members of each group must be informed concerning the use of quantitative data. They should know how to administer objective tests and how to analyze and interpret the data secured through the use of such measurements.

Committees may be formed to investigate standardized objective tests for use in the study of problems selected for supervision. These committees may also prepare objective tests of the unstandardized type for use in the study of pupil progress over specific units of work or in the diagnosis of pupil difficulties. Through committee work the membership receives special training, which in turn is passed on to the personnel of the group which the committees represent.

Group conferences for training teachers in the interpretation of objective data. Progress among individual teachers in the interpretation of objective data can be facilitated through conferences

with small groups using the same materials of instruction. Analysis of objective data and interpretations induced by the questioning of the supervisor should result in increased power on the part of group members to use and understand quantitative findings. The training thus received through the group conferences should enable the individuals concerned better to ascertain the learning difficulties of pupils and to provide corrective and remedial instruction in accordance with the needs of their pupils. The conference about objective data collected from the classrooms of conference members thus becomes an important method of organizing a staff of teachers for growth through the quantitative method of supervision.

Organization of staff members for controlled experimentation. Quantitative measurement in supervision makes possible scientific experimentation in learning and teaching and the organization of the staff to carry on controlled investigations. The results of such investigations are better understood and appreciated by teachers if viewed from the vantage point of participation. Through participation in controlled experiments in learning and teaching, quantitative methods become functional, thereby enabling the individual teacher concerned to acquire better insight into objective data and quantitative techniques. The aims of supervision are thus definitely realized for the individuals supervised through the quantitative methods in experimental projects.

Organization of staff to conduct self-survey of school system. The organization of a teaching staff to carry on a self-survey of a school system offers an excellent opportunity to raise the level of the entire staff in the understanding and use of quantitative methods and to focus attention on their needs for supervision. The quantitative method thus becomes a functional means to an important end. It stimulates interest on the part of the staff in objective measurement and the interpretation of findings with respect to needed improvements. It also supplies immediate motivation to individuals as well as the entire staff to seek appropriate solutions to supervisory problems. With the teaching staff eager to improve and cognizant of needs, supervision becomes a sought-for service instead of an ordeal to be avoided.

Organization of staff to formulate remedial programs. The use of quantitative methods in supervisory programs leads to a demand for remedial work. Pupils in need of special training will be identified, cases of borderline mentality will be found, weaknesses in fundamental subjects will be revealed, and incorrect habits of work and study will be noted—all of which call for remedial service. To meet these demands the supervisor must organize the staff to undertake with individual pupils and with special groups the types of services which needs require. Entire schools may be reclassified, special classes formed for deviate pupils, curriculum reorganization undertaken, and methods of instruction varied in accordance with the problems which need to be met. The formulation of a program of remedial instruction for a school system thus becomes the occasion which through supervisory direction leads to understanding and skill on the part of staff members in quantitative methods and through such understanding to pupil growth.

Organization to Meet the Needs of the System

Supervisory program for towns and small cities. In town and small city school systems in which the program of supervision must be planned and executed largely by administrative officers —sometimes the superintendent alone and sometimes the superintendent with the aid of building principals—a nice balance must be maintained between qualitative and quantitative methods. Systematic qualitative sampling visitation at frequent intervals for short periods must be skilfully employed to identify the problems in learning and teaching to be attacked in the supervisory program. The findings from the use of this method should enable the administrative officer to plan his program to meet both immediate and deferred needs in supervision. Teachers new to the school system or teachers presenting problems in teaching may require emergency assistance. Case studies of some of these teachers may have to be made as a means of bringing about permanent improvement.

Problems in learning, the symptoms of which may be identified in the brief sampling visits, will require careful diagnosis. In

such cases quantitative methods must be resorted to. The most acute problems should be studied first. Suitable standardized tests must be selected or objective tests prepared which will enable the administrative officers to secure objective data that will lead to the diagnosis of the causes of the learning and teaching problems selected for supervision. Through the careful study of the data, the causes of deficiencies in learning are ascertained, the methods employed in teaching are evaluated, and remedial programs are planned. The findings of the objective tests challenge the teachers to improve and a functional situation is thereby created for supervisory assistance.

By carrying on a four-fold program of supervision consisting in (1) systematic sampling of classroom work through short periods of visitation for the purpose of identifying problems in learning and teaching, (2) case study of individual teachers and classes involving prolonged visitation and the collection of extensive data by qualitative methods, (3) objective tests for the quantitative measurement of pupil performance as a means of ascertaining the character of the learning and teaching in the subjects or classrooms identified as presenting problems in supervision, and (4) systematic reorganization of curriculum materials to make possible the realization of the objectives of the instructional program, administrative officers, even though they may be heavily burdened with administrative duties, may find time to carry on a constructive program of supervision in their schools.

Supervisory program for medium-sized cities. The supervisory program of the middle-sized school system will differ from that of the school system in the town or small city in that it will be planned coöperatively by the administrative and special supervisory officers and executed largely by the supervisory officers. The administrative officers, instead of carrying on the activities of supervisors, will evaluate the work of the supervisory officers and advise or require changes in the supervisory program in accordance with the results sought.

The programs of the supervisory officers will be similar in character to those of the administrative officers in the towns and small cities, with the exception that each supervisor's program

will be restricted to the division of the school system or the special department served. The diffusion of responsibility for the learning and teaching in the school system thus created will require coördination within the program by the administrative head of the school system, if balance is to be maintained. In case supervisory coördination is neglected by the administrative head, progress within supervisory fields will vary with the execution of the program in the respective fields.

Little difference should be discovered in the emphasis on qualitative methods of supervision in the two types of systems. The greatest variation will be found in the use of quantitative methods, occasioned by the fact that in the middle-sized school systems the interests of the supervisors are specialized, while in the small systems the interests of the administrative officers responsible for the supervision are usually more general in character.

Supervisory program for large cities. Supervision in large cities varies from that in the other types discussed in that the coördination of departmental programs rests with the building principals rather than with the administrative head of the school system. The head of the system outlines the policies and provides supervisory assistance, but he usually holds the building principal responsible for results. In some large city systems assistant superintendents or district superintendents are held responsible for the execution of the supervisory programs in a given number of schools.

The principal will carry on most of the qualitative supervision, and may or may not resort, on his own initiative, to the quantitative type. The latter is initiated by the assistant or district superintendents and the supervisors. The value derived from quantitative supervision in the large school system usually depends on ability of the building principal to interpret the findings and develop the necessary remedial measures. However, he may utilize either his superior administrative officers or the supervisors as consultants in finding solutions to the problems revealed through the use of the quantitative methods.

Supervisory program for rural areas. In county units or states which accept supervisory responsibility for areas not providing

independent programs of supervision, programs may be developed which compare favorably with those of city systems of corresponding size. As a rule, sampling visitation will be dispensed with in rural supervision and case study based on extended visitation, cumulative records, and data collected through testing programs will be emphasized. The shift in emphasis is explained chiefly on the ground of the factor of distance, which renders frequent visitation of individual teachers by supervisors impossible.

Group meetings on Saturdays may be planned, at which demonstration work is provided with subsequent discussion and round-table conference. The plan of the meetings is determined by the needs discovered through visitation or the analysis of test results. In some areas a series of demonstrations designed to offer instruction on specific needs may be planned and teachers assigned by the supervisors to attendance at the meeting, which will consider the problems of concern to the individual teachers. Systematic planning of demonstration work, group conferences, and supervisory bulletins will probably be utilized in supervisory programs more extensively than in the different types of cities previously described.

The programs of supervision in rural areas depend very largely on the supervisory assistants supplied by the boards of education to the administrative officers. In county and state units very little supervision is carried on by administrative officers. Unless special supervisors are provided in numbers commensurate with the needs of the areas to be served, only nominal supervision will be carried on.

In rural areas under competent administrative leadership which is provided with adequate supervisory assistants, the programs developed and put into execution may be as scientific in character and the results achieved as effective as in city systems. The programs will vary in functions only in accordance with the factors which condition the programs. The use of scientific procedures in the organization and execution of the programs is the constant factor in all properly planned programs regardless of the type of unit or area for which it is planned.

CHAPTER IV

HOW TO USE THE SCIENTIFIC METHOD IN PLANNING THE SUPERVISORY PROGRAM AS A WHOLE

BEFORE YOU READ THE CHAPTER. Persons who work in a supervisory capacity are admittedly busy people. They have many duties and responsibilities. Visits, conferences, reading, preparation of instructional materials follow in never-ending succession. Major projects involve innumerable details in their execution. Emergency demands arise and must be met. The result is that the supervisor is all too likely to go from one activity to the next without the broad over-view and intelligent forethought which make for a well-integrated program.

Chapter IV is a plea for planning in supervisory activities. It deals particularly with the importance of planning the supervisory program as a whole. Subsequent chapters will treat of the application of scientific procedure to the major types of work commonly assigned to the supervisor. This chapter offers suggestions for planning and organizing the entire supervisory program of the school system as a whole and of each particular supervisor, whether assistant superintendent, principal, department head, general or special supervisor. Both short-term and long-term plans are discussed, but the emphasis is placed on long-term planning.

The chapter title implies two theses: first, that the supervisory program is, or at least should be, a unified whole; and, second, that scientific method can and should be applied to the planning of this program. The chapter is designed to develop these two theses and to indicate ways and means for putting them into effect.

The sense in which "supervisory program" is used should perhaps be explained. Every school system which has supervisory officers in addition to the superintendent will have several different supervisory programs in progress. Department heads in junior and senior high schools, principals of every type of school, supervisors in charge either of one or more grades or of one or more fields of subject matter, district and assistant superintendents—all carry some supervisory responsibilities. Each one of the

workers mentioned is concerned with some phase of supervision; each one is operating in accordance with plans which he has formulated more or less consciously. The importance of systematic, unified planning of supervision is apparent if the activities of different supervisory agents are to reinforce each other in attaining the ends which are sought.

The Importance of Planning

Planning in business. The value of wise planning is becoming increasingly appreciated in every phase of life. Private business, particularly the industrial giants of modern society, maintains departments whose duty it is to make and revise plans for future progress. Both long-term plans for developments over periods of ten or twenty years and short-term plans for the program of immediate adjustment over periods of one to three years are included. Short-term plans are fitted into the long-term plan; they are in reality amplifications of sections of the long-term plan. Industry realizes also the need of recognizing that emergencies will arise, and, although the particular emergency cannot be predicted, provision is made for flexibility to meet the emergency when it comes. Every element of the entire plan is based as far as possible on facts.

Public business similarly is characterized by careful planning. Highway development, sewer construction, the provision of water, the construction of public institutions like hospitals and jails, all are planned years in advance to meet the needs which can be anticipated. The year 1933 gave evidence of the increasing need for national planning in the United States. The *laissez-faire* policy in effect previously was believed by many leaders to be incapable of meeting the demands of the depression years, and many felt it had been responsible in large degree for the depression itself. Unified, systematic planning has become tremendously important in America's national life.

Even in the life of individuals a new emphasis on planning is appearing. Pupils are advised to choose early the vocation they wish to follow, and then to plan their education to fit themselves for that vocation. In the matter of personal funds Babson says:

> Behind every history of *unsuccessful* investing is a lack of systematic planning. Behind every record of *successful* investing is a continuous working plan. A plan carefully fitted to the individual's circumstances, conditions, and requirements; a plan which is complete, constructive, and conservative. Correct planning is the foundation of investment success. Without the right plan, success is impossible. With the right plan, success is assured.[1]

This clear and common-sense advice on investment of an individual's money should be heeded by the supervisor, who is an investor of public money and child life.

Planning in education. The need of carefully worked out plans in educational matters is well illustrated by the following extract from a letter from a superintendent of a southern city.

> When our state legislature met this past year to reduce the state budget by $7,000,000, the road men and bridge men were there with their programs for the present emergency, and all figures for the past twenty years and for the next ten years. We school men had nothing to present except pleas for boys and girls. We had the better aim, but the other fellows had the plans and facts. We lost, they won. I learned a lesson. I wonder if all supervisors in the United States have.

Supervision is no exception to the universal need for planning. But where shall supervisors look for help in planning? Practically no presentation of the characteristics of good plans and the procedures in planning unified long-time and short-time programs is to be found in treatises on supervision of instruction.

Scientific Planning of Supervisory Programs

Many who accept the place of scientific planning in business, government, and private life are uncertain as to the possibility of applying scientific procedure to the planning of supervisory activities. True, the analogy is not perfect. In industry, the goal is relatively simple, constant, and capable of evaluation; furthermore, only those raw materials are used which contribute to attaining the outcome desired. In education the goal is a complex, variable growth difficult to evaluate exactly; all the raw materials must be accepted and used. Nevertheless, the major scientific considerations in formulating a program are substantially the same, and the underlying assumptions are similar.

[1] Babson, Roger W., *Investment Fundamentals.* New York: Harper & Brothers, 1933 edition, p. 192-193.

Underlying assumptions. First among these assumptions in planning supervisory programs is that there is more than one way of solving supervisory problems, and that the supervisor needs a systematic plan for choosing as objectively as possible the one best way. Planning involves choice among alternatives. A second assumption is that the use of the scientific procedure, and more particularly the adoption of the scientific attitudes, is the key to making intelligent choices in the formulation of supervisory plans. A third assumption is that the characteristics and steps of scientific procedure can be known and practiced, to a degree at least, by persons in all types of supervisory positions. A fourth assumption is that a consciousness of and a desire for scientific procedure will lead to experience which, in turn, will yield increasing control over the use of scientific method in the planning of supervisory programs.

Factors to Be Considered in Making Supervisory Plans

Most supervisors are convinced of the value of plans for their whole programs as well as for their day-to-day activities. They are desirous of making their plans as scientific as possible. What general factors should be taken into consideration in the preparation of plans? Which of these factors is of special importance to each type of supervision?

Relation of plan to background of current situation. Perhaps the most important factor to be considered is the degree to which the plan grows out of the actual local situation and is adapted to it. Good planning always builds upon what has gone before. Good planning involves the discovery of past strength and weakness; it provides for the maintenance of the one and the correction of the other. In point of time, the planning activity begins with a review of the existing situation and the conditions which have brought it about; it then proceeds to ways and means of improving the current situation. Relating the plan to the need is evidently appropriate for every type of supervisory position.

Balance among all purposes to be served. The complexity of the educational and supervisory process is so great that the supervisor must take into account many and varied purposes. Pupil

growth through teacher growth, as has been stated, is the central purpose.

But there are many phases of pupil and teacher growth, and there are many intermediate and associated purposes. Any reference to educational objectives brings to mind at once such varied outcomes as wise use of leisure and mastery of fundamental tools. Teacher growth may occur in control over a particular technique of teaching or in the acceptance of a new philosophy of education. Purposes with reference to the attitude of parents and taxpayers toward the school may need to be considered. From the point of view of planning, the significant fact is that every supervisory program has several purposes, and a judicious balance among them is desirable if the program is to be effective.

A complete and perfect balance is clearly not to be attained in any one part of the supervisory program for a school system. The supervisor of handwriting will seek the best possible balance in his own program. The head of the high school department of English will likewise seek balance in his program. The principal, whether of an elementary, junior high, or senior high school, will similarly seek balance and may be able to attain it fairly completely because he is concerned with a number of grades and subjects. But it is in the superintendent's broad supervisory program for the entire system where a nice balance among different purposes is particularly to be desired. The superintendent is the final coördinator of purposes.

Relations among different supervisory programs. Another approach to balance is through such planning by each supervisory agent that his program dovetails into the program of each other supervisory agent in the school system. Not only should the purposes be allocated and coördinated among different types of supervisors but also the activities carried on must be fitted together efficiently. Unless such coördination occurs, conflicts arise between different supervisory officers, such as superintendent and principal, supervisor and principal. The Sixth Yearbook of this Department was devoted largely to the consideration of conflicts and means of eradicating them through providing effective organization of instructional leadership. The following quotation

indicates the findings regarding the frequency and importance of conflicts:

> Conflicts existing within different school systems are frequent enough and of such varied and sundry kinds that careful planning for the elimination of them and their harmful effects should be considered if integration of subject matter and personality is to be realized.[2]

No one supervisory agent should plan his program independently of the programs of other agents who deal with the same pupils or the same teachers. The principal and the general or special supervisor need to know each other's plans and to adjust to them. The department head's plans need to be organized in relation to his principal's plans and to the plans of the supervisor in charge of his field. The rural supervisor's plans should bear an integral relation to the more general plans of the county superintendent or commissioner under whom he works. Truly coöperative planning is the only solution.

Length of period covered by plan. How long a period should be covered by a supervisor's plan? No one answer can be given, because conditions vary too greatly. In general, however, planning should cover both a long and a short period. The long-term plan is necessary if there is to be continuity in the program and if the various elements are to receive their due weight. Such a plan may well be projected three or five years in advance, even though the major outline only is formulated. The short-term plan which covers but a semester or a year is essential if the details of the program are to be considered in advance, for details cannot be anticipated far in the future. Obviously the short-term plan is but an amplification of one section of the long-term plan. Each plan influences the other: the major outline over a period of years determines the points of emphasis in any short period; the short-term plan, because of its specific character, brings to light desirable modifications in the long-term plan. In addition to both of these types of plans, there needs to be an appreciation of the fact that emergencies will arise, and of the consequent importance of flexibility in any plan which is adopted.

[2] *Effective Instructional Leadership*, Sixth Yearbook, Department of Supervisors and Directors of Instruction, N. E. A. New York: Teachers College, Columbia University, 1933, p. 51.

The character of the plan will differ somewhat, depending upon the length of time covered. In so far as the plan relates to pupil growth, the long-time program will deal particularly with preventive or constructive teaching, with the provision of original experiences for pupils which will result in the development of desirable outcomes without the necessity of considerable remedial work; the short-time program will stress remedial teaching, the discovery and correction of pupil errors. As regards teacher growth, the long-time plan will emphasize general development in the understanding of and control over the whole educational process; the short-time plan will provide for helping teachers to meet their immediate problems. Both types of plans are needed if the purposes of supervision are to be achieved.

A major advantage in having a plan for a fairly long period is the guarantee thus given that the supervisory activities in process at any one time will be related to the activities carried on both previously and subsequently. Supervision is a continuing process. The supervisor needs to take care that his activities lead on from one to the next without sharp breaks. Adherence to a systematic plan is the supervisor's best insurance of continuity in his program.

Characteristics of Good Supervisory Programs

An effective supervisor will develop a program that is (1) complete, (2) continuous, (3) conservative, (4) progressive, (5) constructive, (6) flexible, and (7) integrated.

To be complete, the program must take into account all the personnel concerned, all the materials available, all the problems to be met, all the elements involved. The personnel to be considered will include not only pupils, teachers, and supervisory officers but also the board of education, the parents, and the community at large. Organizations and agencies which may influence pupil growth through teacher growth should be considered also. They include local ones, such as English clubs, history clubs, and other organizations of teachers; and non-local ones, such as national organizations which influence teachers through their conferences and publications. Instructional mate-

rials, including textbooks, library books, visual aids, etc., exist in large number in every system and need to be considered. Likewise the supervisor will use his knowledge of the elements in supervision as revealed in various check-lists of duties, opportunities, activities of supervisors, "likes and dislikes of teachers for supervisors," and the other types of items included. The scientific supervisor, however, will not be swayed too much by majority opinion, by modes and averages in the reports. He knows that "America would not have been discovered on the basis of majority opinion." He is constantly mindful of the "thinking minority." Against the composite of all these many bases, he checks his program for completeness.

To be continuous—the second characteristic—means that the program is "connected, extended or prolonged without separation or interruption of sequence." One major reason for a program's not being continuous is the lack of definite aim and the absence of knowledge of circumstances that may arise and affect the program. Lacking in aim, there is no central core and hence no integration of the various minor problems that of necessity occupy the teacher's and supervisor's time. Furthermore, there is no logical sequence of the minor problems in the program. Scientific procedure implies that there should be a central core around which the minor problems are ranged in logical sequence so that each successive step is founded upon actuality and not upon theory, and will lead ultimately to the unified whole. A continuous plan is opposed to "trying this and trying that," or to the "do something" idea.

To be conservative means that the program preserves the values in existing modes of action. It implies that supervision should be based upon proven procedures wherever possible. Planning conservatively, therefore, involves a continuous study and appraisal of reports of relevant research. The non-conservative supervisor is inclined to be carried away by "latest ideas," by "ideas in magazines," and by "what has worked in one case," and, finally, "by his own dreams." A well-considered, conservative program is not in opposition to progress, nor does it imply lack of vision and enthusiasm, but it does imply foresight. It

means everything involved in scientific procedures, for in science every step is carefully thought through before proceeding to the next.

To be progressive implies that the program is forward-looking. As was suggested in the preceding paragraph, the supervisor needs to maintain and conserve those elements in his program which have proved to be effective. But a program which looks only backward is incomplete, to say the least. Provision should be made consciously for striking out into new fields of activity on an experimental basis in order to discover additional effective procedures. Every program should include, in addition to the continuation of activities of known value, the trial of selected approaches to improved procedures. The able supervisor is continually re-surveying his problems, re-formulating his solutions, and devoting a definite portion of his time to discovering new and better ways.

To be constructive implies that the primary purpose of the program is to ***help*** teachers and pupils. Many teachers have entered the profession with high hopes but have soon found themselves overcome by routine—"they have died professionally." What they need is help from a sympathetic supervisor, a supervisor whose program calls for guiding teachers to the results of scientific studies, to the practice of research, and to a stimulation to find for themselves increasingly better ways for doing things.

The constructive supervisor conducts his conferences and visits with his teachers avowedly as a service agent ready to encourage rather than to censure or rate. Constructive procedure in program building is based upon a vital truth about human beings, namely, that their actions are better motivated by insight, inspiration, and coöperation than by coercion, commands, and orders. Teachers' moods are considered as well as their abilities. Upon their moods and accomplishments the scientific supervisor begins to rebuild. That is what science does. It takes what is, analyzes it, and constructs upon it.

To be flexible implies that the program is adaptable to changes in conditions. Changes in the curriculum, in the organization, in the personnel, in the financial support of the schools all call

for corresponding changes in the supervisory program. A plan that is too rigid to allow for modification is almost worse than no plan at all. The scientific method requires a readiness to change the procedure in accord with the facts that are brought to light.

To be integrated. This term is not used just because it is modern terminology. A scientifically constructed program is integrated. It fits the short-term plans into a whole, and the elements of each short-term plan into their proper relationship. To construct an integrated program means the passing from a complex, unstable one to a relatively simple, stable one.

An integrated supervisory program, for example, considers both vertical and horizontal coördination of effort and integration of elements. From first grade through high school the grades actually work together, the work of each being intelligently dovetailed with that of the others. Teachers of mathematics will work together from the lower elementary grades through the senior high school. But also each teacher within this vertical line will work horizontally with the teachers in other fields, particularly those closely allied. Furthermore, this vertical and horizontal integration takes place not only among the grades and the subjects within the regular school curriculum but also with all school agencies and out-of-school agencies.

Procedure in Planning the Program as a Whole

This section is designed to apply to program-making generally. Although the details of the problem will differ, the theory, criteria, essentials, and major steps are the same. The supervising principal in a rural village, the county superintendent, the superintendent in a small city, and the superintendent of instruction in the largest city, all have the basic elements to consider and all may apply the scientific criteria and steps. Special supervisors and grade and high school supervisors should most assiduously follow scientific procedures, for the more intricate the system, the more varied the types of supervisors, the more essential it is that each should plan and integrate with the whole program. On the other hand, the more remote and isolated a

supervisor's position the more he needs to train himself in at least the elements of scientific procedure in order to facilitate the conduct of his wide and varied program.

The general problem confronting the supervisor in planning his program is how to budget his time and energy in order to secure the best possible results in the improvement of instruction, in pupil growth through teacher growth. The steps in the making of the plan parallel those of the scientific method in general. They are:

1. Survey of the situation to discover needs.
2. Formulation of tentative plans or modes of solution.
3. Selection of the "best" plan.
4. Evaluation of the plan adopted.

Survey of the situation. Obviously, the first step is to collect and classify the significant facts about the situation in order to delimit the general problem and to discover leads to possible modes of solution. By modes of solution are meant the supervisory activities believed most likely to contribute to the solution of the problem.

Information needs to be gathered about every element in the situation. First, especially in the case of a new supervisor, the supervisor should collect and organize the data about the community in order to sense the distinctive purposes and interests of the local public to be served. This information may be secured through a sociological survey[3] in which the teachers as well as the supervisor should share.

The characteristics of the pupils should be known. The supervisor should inform himself as to their nationality, social background, physical condition, mentality, and other factors which condition their growth. Similarly, he will wish to know the degree to which they are at present attaining the objectives of the school in order to determine the points on which he should place emphasis in his plan.

Since the teachers are the prime factor in the instructional program, the supervisor will do well to study them to learn about

[3] Thomas, John S., "Studying the Community," *The Principal and Administration*, Ninth Yearbook, Department of Elementary School Principals, N. E. A., Washington, D. C., 1930, p. 605-612.

their training, experience, teaching ability, and, above all, their philosophy of education. Information may be obtained through questionnaires,[4] through conference, and through statements from teachers on such subjects as "What is Education?" "My Philosophy of Education," and "Our Aims and Problems."

The curriculum in effect needs to be known thoroughly by the supervisor. How closely is it in accord with the findings of curricular studies? Is the course of study available to all teachers? Is it followed by teachers? Are the textbooks and supplementary books in use of such a nature as to provide for the attainment of the objectives of the system?

Supervisory programs conducted in previous years should be known and considered in planning any new or continued program. What was the philosophy underlying the former program? Where was the emphasis placed? What means were used? What response was made by the teachers and the community at large? The scientifically-minded supervisor builds upon the past and recognizes that change must be gradual.

What is the existing supervisory organization? In every system except the very smallest, more than one supervisory officer will be found. The supervisor needs to understand the policy as to relationships among supervisory agents if he is to plan his own work intelligently. In particular it is important that the relation between the building supervisor (principal) and the general or special supervisor be clearly defined and understood. Furthermore, each supervisor needs to take into account the special abilities and interests of other supervisory officers if he is to avoid friction and to work harmoniously with them. No one supervisor can plan alone.

In every actual situation there are some limiting elements that are very practical. If the program is to include provision for teacher growth through professional reading, library facilities must be available. Are there such facilities? Are they adequate? Are they readily accessible to teachers? What opportunity is there to extend the facilities? Likewise, if mental and educational testing is to be a part of the program, funds for tests will

[4] See, for example, the one in Chapter VIII, pages 139-141.

be needed. Are there funds for this purpose? If the funds are not adequate, what is the possibility of developing tests and making them available locally? Facilities for reading and for testing are but two of the practical elements in the situation. Others will occur to every supervisor, and require investigation.

Finally, the supervisor needs to study himself, to inventory his own strengths and weaknesses. A supervisor is often blind to some of his own greatest strengths. A review of supervisory check lists may aid him to appraise himself more fairly. One supervisor, after checking himself in this way, was impressed by his lack in certain regards and set out at once to enroll in extension classes in economics and sociology. Herein is a suggestive lesson for other supervisors.

Formulation of alternative plans. Granting that the situation has been surveyed and the supervisor feels himself acquainted with the essential elements, his next step is to array several possible plans which appear to meet the needs revealed. One may ask why several plans should be formulated at this point rather than one best plan. The reason is, as the scientific worker realizes, that the one best plan can only be chosen from among alternative proposals. Furthermore, the very effort to set up several choices brings to light elements which might not otherwise come to mind. The one best plan which is finally chosen may then include selected elements from each plan.

Alternative plans should be set up both for the long-time and the short-time program. The long-time plan will indicate the points of emphasis in the complete program and will suggest the sequence of the activities. The short-time plan will expand one section of the complete plan, rendering it specific and concrete.

Plans may be organized in many ways. An illustrative outline of the major divisions commonly found in supervisory plans is as follows:

1. Purposes to be achieved.
2. Scope of the plan—both in time to be covered and in subjects, grades, and buildings to which the program is to apply.
3. Relative emphasis on particular instructional objectives, methods, and materials.
4. Relative emphasis on *supervisory* means to be utilized, each in rela-

tion to the *instructional* program—visitation, demonstration lessons, building meetings, grade meetings, subject meetings, inter-room visitations by teachers, individual conferences, committee work, supervisory bulletins, etc.

5. Specific jobs to be done—courses of study to be prepared; surveys and experiments to be undertaken; books to be selected, etc.
6. Provision for relationship to programs of other supervisory officers.
7. Provision for appraisal.

Some plans may contain additional points, but it would seem that any plan which is to be adequate should include at least these seven divisions.

Selection of plan. When the supervisor has several possible plans in mind he is ready to choose or construct the one which fits his situation best. Ideally, if he were to follow the scientific procedure to the limit, he would try out all the plans and choose the best in terms of its effects. Practically, however, there is little or no opportunity to experiment with various plans. He can only try them out in imagination and endeavor to foresee the consequences of each. On the basis of his best judgment of probable effects he makes his choice. He may, however, invite the assistance of other supervisors—yes, and teachers too—in appraising the different programs which have been projected. These other workers may see strengths here and weaknesses there which he had failed to see, and thus aid in making the decision. In addition, he may appraise the plans in the light of experience with similar plans as recorded in the literature of supervision or as reported by teachers who have had experience with these plans in other school systems.

At this point, too, the supervisor will give attention to possible combinations of the proposed programs. He may choose one as his basic plan but will endeavor to incorporate in it as many as possible of the good features of the other proposals. He may thus arrive at a composite plan which is superior to any single plan.

Although it is not possible to compare the plans through experimental trial, yet the supervisor will do well to think of his final plan as somewhat tentative. He should be ready to make changes in it as he observes it in action during the time which

it covers. The attitude of holding conclusions as tentative is an important element of the scientific procedure.

Provision for appraisal of the plan. The appraisal of supervisory activities is admittedly difficult, although a previous yearbook[5] of the Department offers many helpful suggestions. Nevertheless, the supervisor who wishes to work scientifically is obligated to include in his program some provision for its appraisal.

The worth of a supervisory program is to be estimated in terms of its effects upon pupils, teachers, the community, and the supervisor himself. Of these criteria, the growth in pupils is obviously of primary importance. Chapter V deals particularly with the appraisal of instructional outcomes as they relate both to pupils and to the community at large. In general, appraisal will consist of comparing the changes observed—whether in pupils, teachers, or community—with the changes sought as defined in the objectives adopted in the program. Both qualitative and quantitative, both objective and subjective means are to be utilized.

Adaptation of Procedure to Differing Supervisory Situations

The discussion has dealt with the planning of supervisory programs without special reference to the distinctive problems of the different types of supervisory officers. The limitations of space make it impracticable to attempt any thoroughgoing consideration of the adaptations necessary in these situations. Furthermore, it is probably true that the differences in programs among the different types of positions are but little if any greater than the differences in programs among the individuals who hold any one type of position, such as high school principal. Every supervisor's program must be adjusted to fit the conditions and the requirements of his particular position. The entire chapter has been written to aid each supervisor to discover the elements of his problem and to plan activities which are appropriate.

[5] *The Evaluation of Supervision,* Fourth Yearbook, Department of Supervisors and Directors of Instruction, N. E. A. New York: Teachers College, Columbia University, 1931.

CHAPTER V

HOW TO USE THE SCIENTIFIC METHOD IN THE APPRAISAL OF INSTRUCTION

BEFORE YOU READ THE CHAPTER. If supervision means pupil growth through teacher growth, the supervisor evidently needs knowledge of pupil progress at various intervals. This chapter is designed to indicate ways and means of appraising the effects of the instructional program upon pupil growth. Perhaps the chief contribution of the chapter is its suggestion of a many-sided appraisal. Educational tests are included, as might be expected. But school records and community response are treated also as equally important elements in a well-balanced appraisal. The implication is that the supervisor who wishes to appraise the effects of the instructional program will utilize every possible source of information concerning those effects.

One major function or responsibility of the supervisor is the continual appraisal of the instructional program. Only in the light of the facts which reveal the situation as it exists can progress come and modifications be made. The facts collected should pertain to every phase of the instructional program which has any bearing whatsoever on the growth of pupils toward the desired goals. The facts should deal with the whole program of the supervisor, with the curriculum, the course of study, the means of providing for teacher growth, the materials for classroom use, and other means of providing for the growth of individual pupils. Through knowledge of the effectiveness of each of these means, the supervisor can make desirable changes.

The responsibilities of the supervisor for the appraisal program may be classified in four groups:

1. He is responsible for the growth of pupils in his charge, whether it be in a city, a county, a single school, a department in a school, a grade in a city, or a division of several grades in a city.
2. He is responsible for discovering teachers in need of help and giving just that help which is needed.
3. He is responsible for providing the means by which teachers may

know the growth that pupils have made and pupils themselves may know their own growth.

4. He is responsible for collecting objective facts about pupil growth in order that he himself may study intensively any phase of his program.

Such a four-fold program of responsibility in connection with the appraisal of instruction will mean that the supervisor should appraise not only the results in the classroom but also all the means used in providing for growth in pupils.

The Meaning of Appraisal

Appraisal is a very general term. In this chapter it is used in its broader concept because it covers all aspects of estimating the worth of the program in terms of the objectives set up. Such a program of appraisal should be comprehensive and well balanced. It should take into account all the objectives which the school has set up as well as all the contributing factors which foster or hinder pupil growth.

For this reason appraisal should not be thought of merely as the compilation of data showing the skills and knowledges acquired by the pupils nor as the giving and administering of standardized commercial tests to make comparisons with available norms. It should rather be thought of as the collection and interpretation of both quantitative and qualitative data which have any bearing on the progress of pupils and on the effectiveness of the classroom activities which foster that growth.

Characteristics of good appraisal. The characteristics of good appraisal in an instructional program should be the same as those in any program whose purpose is to discover truth. Good appraisal calls for:

1. A carefully worked out plan of procedure.
2. A comprehensive program.
3. The collection of facts.
4. The use of measuring instruments which are valid, reliable, and objective.

It is understood, of course, that the appraisal program of a supervisor will depend on the particular niche he fills in the organization of the school system in which he works. The pro-

gram of a superintendent of schools in a large city will differ from that of a department head in a junior or a senior high school in the same city. In the same way, the plan of a superintendent of schools in a county unit will differ from that of the superintendent of schools in a town in that county. The appraisal program of the supervisor of a subject will differ materially from the program of a supervisor of one or more grades of a school system.

However, the general characteristics of good appraisal and the application of scientific method to the task of appraising the program will differ only in degree and not in the fundamentals. The characteristics of good appraisal apply in all fields of instruction. Regardless of the field or the division of the school system in which the supervisor is working, his appraisal program should be so comprehensive that it will require the collection of facts from three sources, namely, objective tests, school records, and community response.

Appraisal of Major Outcomes of Instruction

Before the supervisor can collect facts relative to appraisal, he should analyze rather completely the purposes of the program which he is to appraise. The purposes are usually stated in terms of the major outcomes or the objectives of instruction. The means used for choosing scientifically the objectives of a program are discussed at some length in Chapter VII. For this reason it will be assumed here that the objectives for the school system, for a particular school, or for a subject have already been chosen. Too frequently, however, all the objectives of the instructional program are not appraised by the supervisor.

Although many schools agree upon the general products which are aimed at in the schools, each school system probably has different means for attaining these general objectives. A decade or more ago it was considered that a mastery of the tool subjects in the elementary school and of the required subjects in the secondary schools was all that could be expected of pupils in any educational program. However, with the shift in point of view of the purpose of the schools as outlined in Chapter II, and the

changes in the social and economic conditions which have arisen, the school program has been altered considerably. This change is reflected not only in the subjects offered but in the statements of the educational objectives and the policies formulated by the leaders.

Classification of objectives. No end of different listings of objectives might be made. However, three will be given for the purpose of showing the products at which many schools are aiming. Some schools have adopted as their goal what are known as the seven cardinal principles: health, command of fundamental processes, citizenship, vocational preparation, worthy home membership, worthy use of leisure, and ethical character.[1] Most of the literature in the field of appraisal shows that measurement has been made primarily in the second of these seven, with some emphasis given to the first, but relatively little to the latter five.

Other school systems have adopted a six-fold classification of objectives: to understand and practice desirable social relations, to discover and develop desirable individual aptitudes of pupils, to cultivate the habit of critical thinking, to appreciate and desire worth-while activities, to gain command of the common knowledges and skills, and to develop a sound body and normal mental attitudes.[2] Again an analysis of the measurement programs used in many school systems reveals the fact that the emphasis has been placed primarily on the fifth of these six objectives.

Still other school systems have adopted a policy which likewise may be considered to have a six-fold classification:

> Education is to be conceived as a unitary process having for its goal the development of individuals able to live efficiently and happily in a democratic environment with profit both to themselves and to the society of which they are members.
>
> More specifically, one important goal of instructional effort shall be the ability of pupils to recognize, on their own initiative, the existence of essential life problems in situations and the will to solve such problems.

[1] *Cardinal Principles of Secondary Education,* U. S. Department of Interior, Bulletin, 1918, No. 35.

[2] *Cardinal Objectives in Elementary Education.* A Second Report prepared by the Committee on Elementary Education of the New York Council of Superintendents. University of the State of New York, Albany, October 1, 1929.

> The attitude of courageous optimism that problems can be solved by intelligent effort is an important aspect of this goal.
>
> A second goal shall be the ability to plan the solution of problems and to execute plans efficiently, together with all that this implies in the way of ability to profit by self-criticism and by the criticisms and assistance of others.
>
> A third objective shall be the ability to generalize from experience, to profit by living, to will to better both one's own conditions and the conditions of social life.
>
> A fourth objective shall be the ability to coöperate with others in the solution of social problems, and the will to exert such ability.
>
> A fifth objective shall be acquaintance with the sources of knowledge and with the methods by which they may be used efficiently.
>
> A sixth objective shall be efficient control over the knowledges and skills most generally needed by children and adults.[3]

As in the other list of objectives, measurement has been directed mainly to the last of these six, although the persons who formulated these objectives believe the sixth to be no more important than others in the list.

Regardless of the types of objectives or the goals set up, it is important that the supervisor make sure that the relative importance of each has been considered before any attempt to survey the products is made. It is true that it may not be possible to measure the degree of success attained in all the objectives, yet it is necessary to make sure that all the objectives have been listed and an attempt made to measure as objectively as possible the products which make up the goal of education.

A complete list of the objectives of the school system will usually show that some are more important than others. But what is the relative importance of these objectives? How much more important are some than others? Again, literature on the subject reveals little uniformity in the answers to these questions. Some supervisors believe that the amount of time spent on each objective should be the determining factor. They study the time allotment of their instructional program to see which subject receives the greatest amount of time.

Other supervisors consider that expert opinion of teachers, principals, and supervisors is the most significant evidence which they can secure in determining the relative value of each

[3] *Detroit Educational Bulletin*, XIII (October, 1929), p. 1-2.

objective. It is generally recognized that such opinions are valuable, but the method used to secure these opinions will determine their value to a considerable extent.

In obtaining such opinions each one concerned should make sure that some sort of rating scale is used. The scale may be nothing more than a rank order rating. Whatever the nature of the scale, it is evident that weights will be assigned to each objective.

Once the supervisor has decided upon the relative value of each objective, the real task of appraising the program begins. For convenience, the different modes of appraisal may be classified under three headings; however, all three are alike in that they require the collection of facts and the interpretation of those facts. The three modes of appraisal are: (1) objective tests, (2) school records, (3) community response.

Objective Tests as a Mode of Appraisal

Objective tests as a mode of appraisal of the instructional program have been in use only since the early part of the twentieth century, when the first tests were published. During the intervening time many tests have been used for the purpose of appraisal and many books[4] have been published describing very completely the steps to be taken in such a program.

All these books either outline four steps to be followed or imply that the supervisor should follow such an outline. These steps are: (1) planning the program; (2) selecting the measuring instruments; (3) collecting the data through the use of the tests; (4) interpreting and evaluating the results.

Planning the program. The planning stage of any program is more important to the supervisor who is using the scientific method than the amount of literature on the subject would lead one to think. The planning stage is really the beginning stage. The axiom, "Well begun is half done," applies to a testing

[4] Woody, Clifford, and Sangren, Paul V., *Administration of the Testing Program.* Yonkers-on-Hudson, N. Y.: World Book Company, 1933.

Webb, L. W., and Shotwell, Ann N., *Standard Tests in the Elementary School.* New York: Ray Long and R. R. Smith, Inc., 1932.

Ruch, G. M., and Stoddard, George D., *Tests and Measurements in High School Instruction.* Yonkers-on-Hudson, N. Y.: World Book Company, 1927.

program just as much as to any other undertaking. Careful planning at the outset may save hours of labor later in the program because many errors can be avoided and difficulties foreseen and overcome. Rankin[5] says that "the planning stage is the stage of choices," and that the supervisor must make two major decisions before his testing program is initiated. First, choice must be made between the extensive, large-scale survey and the intensive, small-scale survey. Second, choice must be made of the general conditions under which the survey is to be conducted. Further, Rankin says, "The plan should include definite provision for each of the various stages in the survey. Many workers find it helpful to have two plans: one organized around the steps of the procedure and the other organized in terms of the time sequence."

Woody and Sangren[6] state that the nature and extent of a testing program in any school unit should be determined very largely by the conditions existing in the unit. Furthermore, they list five factors to be considered in planning the testing program. These five factors are:

1. Existing machinery for the administration of a program.
2. The experience of teachers with tests and testing technique.
3. The attitude of the community toward the testing movement.
4. Previous testing practices and policies.
5. The availability of suitable instruments of measurement.

Selecting the measuring instruments. The problems connected with the selection of measuring instruments are by no means easy of solution. The supervisor needs to decide whether the tests are to be used only for survey purposes or whether they are to be used for survey, diagnostic, and prognostic purposes. Usually a test is designed for one purpose primarily and therefore is less useful for other purposes. However, plans should be made to insure the maximum use of tests.

In selecting tests, care must be taken to see that they are objective, reliable, and valid. A test is considered objective if the

[5] Rankin, Paul T., "Survey Techniques for the Experimental Determination of the Value of Materials and Methods," *Scientific Method in Supervision*, Second Yearbook, National Conference of Supervisors and Directors of Instruction. New York: Teachers College, Columbia University, 1929, p. 226-227.

[6] Woody, Clifford, and Sangren, Paul V., *op. cit.*, p. 30.

scoring of the answers is not dependent upon the opinions of the scorer. A test is considered reliable if it measures consistently whatever it does measure. A test is considered valid if it measures what it purports to measure. Nearly all the commercial tests on the market today are objective; most are reasonably reliable; but evidence of their validity is less frequently given.

Even though individual tests meet standards of reliability or validity, they may not measure the whole product which is aimed at in the subject. Consider, for example, a test in mathematics which measures only certain skills. The objectives of that course may state that the course aims to develop attitudes, knowledges, and skills, as well as power to use these abilities in problem situations.

A close examination of the tests in the various fields available reveals the fact that many can be used to measure only knowledges and skills. Thus it would appear that such tests are measuring only a partial product. They are not valid for measuring all the objectives of the subject.

Again it may be that among the objectives in the course in social science, for example, will be found emphases on attitudes and conduct as well as on the knowledge aspects. But the tests which are used may measure only the knowledge aspects of the subject. Can such tests be considered valid from the standpoint of the whole course? Obviously not. Therefore, it is necessary that the person responsible for the measurement program select those instruments or means of evaluation which will appraise as many of the objectives as possible.

The problem of making the proper selection is a vital one to the supervisor. He should subject each test considered to the following questions:

1. Will the use of the test tend to center attention on a desirable aspect of the teaching of the subject?
2. Does the test have recent, well-defined, and comparable norms with which to make comparisons?
3. Is the test easily given and easily scored?
4. Does the test have a high reliability?
5. Is the test a valid measure of the things to be measured?
6. Is the test sufficiently reasonable in price to warrant using it?

Further, he will make sure that the entire battery of tests covers the entire set of outcomes of instruction. No single test can measure comprehensively; the group of tests chosen should do so, however.

Collecting the data. After the measuring instruments have been selected, the supervisor is confronted with the task of determining the administration of the tests to secure the data desired. He needs answers to such questions as the following: At what time of the school year is the testing program most desirable? Who shall administer the tests in the classroom? What training is necessary to prepare people to give the tests? How will the tests be distributed to the schools? What assurance can the supervisor have that children will not be coached on the tests before they take them? How are the tests to be collected? How are the data to be consolidated?

Tests must be thought of only as tools. They are designed as a means of obtaining evidence on how well pupils perform under particular conditions. Therefore the success of their use depends upon two major factors:

1. The examiner's recognition of the conditions under which measurement becomes meaningful.
2. The examiner's ability to adjust the giving of the tests to the basic considerations in spite of unpredictable occurrences in the classroom.

The major considerations in giving tests may be summarized under the following heads: (1) use of proper incentives, (2) avoidance of coaching, (3) adjusting of explanations to individual needs, (4) timing of the tests, and (5) securing of accuracy in the scoring of the tests.[7]

In addition to these major factors, a number of minor factors which affect measurement need to be considered and should be clearly understood by the examiners before they attempt to give the tests in the classroom. These minor factors are: choosing the time of day at which the tests are to be given, training pupils in the technique of taking tests, using pupil help in handling materials, and making allowances for extenuating circumstances.

After the tests have been given, the next problem is the scor-

[7] *Detroit Testing Manual,* Board of Education, Detroit, Michigan, 1931, p. 12.

ing. Often this work can be done by the pupils themselves, especially in the upper grades in the elementary and in all grades in the secondary school. Just how the scoring is to be done will depend to some extent upon the nature of the tests and upon the conditions in the school or in the grade in which they are given. If the tests are scored by the pupils themselves, papers should be exchanged and corrected under the direction of the examiner. Some examiners have found it advisable to take the tests to a different room and have them scored by pupils other than those who took the test. Others have found it advisable to have adults do all the scoring.

Interpreting and evaluating the results. After the tests have been scored, the question of organizing the data becomes very important. Some method must be devised which will give meaning to the scores made on a test by an individual pupil, a class, a school, or a city. For an individual pupil, the problem is to interpret his score so that the teacher (and the pupil himself) may have the fullest possible understanding of its meaning. For a class, school, or city, there is the problem of understanding and also the problem of summarizing the scores for a group of pupils.

The latter problem is relatively simple. All teachers and supervisors are familiar with the use of measures of central tendency as expressions of the accomplishment of groups. Two measures of central tendency are commonly used. They are the arithmetic mean and the median. The mean is commonly known as the average. The median is the point which has as many scores above as below it.

The question of interpreting the original score itself, whether the score of an individual pupil or an average score for a group of pupils, is much more difficult. Original or raw scores on any type of test are worthless in themselves. The number of items in a test, the difficulty of the items, and the methods of scoring the test may vary so widely from one test to another that the same original or raw score may mean excellent achievement in one case and very poor achievement in another. For this reason it is necessary that the raw score be converted into some derived

score which will be meaningful in the situation in which the teacher or supervisor wants to use it.

Persons who use educational tests commonly have two purposes to serve in the interpretation of scores. One is to express the raw scores in all tests in all fields in the same terms. Just as one would reduce measures in miles, yards, feet, and inches to some one measure, such as yards or meters, so does a supervisor need to reduce raw scores in words per minute, problems solved, and quality of handwriting to some one measure, such as educational age, or grade level. The type of derived score to meet this purpose may be called an absolute score, because such a score signifies the same accomplishment regardless of the characteristics of the pupil making the score. An educational age of 10 years, 4 months means an achievement equal to that of the average of all children whose chronological age is 10 years, 4 months. Educational age and grade level are the two absolute types of derived scores most generally found valuable by teachers and supervisors.

The other purpose is to express the raw score in a form which gives a relative measure of the satisfactoriness of the achievement. Such a measure takes account of factors beyond the pupil's control which nevertheless influence his accomplishment, such as his grade, age, and brightness. Thus an educational age of 10 years, 4 months in reading would be judged very satisfactory for a pupil in the third grade whose chronological age is 9 years, 8 months, and whose intelligence quotient is 85. The same educational age of 10 years, 4 months would be considered quite unsatisfactory for a pupil in the fifth grade whose chronological age is 11 years, 1 month, and whose intelligence quotient is 120. The teacher may rightfully expect better achievement from the latter pupil than from the former. A measure which is designed to serve the general purpose here discussed is the accomplishment quotient.[8] Another measure used in some school systems is the relative rating.[9] Neither of these measures is generally accepted and approved, but the principle of interpreting achievement in

[8] Kelley, Truman Lee, *Interpretation of Educational Measurements.* Yonkers-on-Hudson, N. Y.: World Book Company, 1927.

[9] *Detroit Testing Manual,* p. 70-75.

the light of the factors which condition achievement is not questioned.

In dealing with the city as a whole, it is sometimes impossible to make a comparison of the results from one school with those from another school because the communities in which the schools are located may be very different.[10] Scores may be derived, however, which will show the relative effect of the different factors. Such derived scores as grade level, educational age, accomplishment quotients, and relative ratings may be used to advantage by the supervisor in his appraisal of the city-wide instructional program.

School Records as a Mode of Appraisal

The school records of pupils have been used for many years as a mode of appraisal.[11] They can be of great value in the study and understanding of the characteristics, needs, and accomplishments of each individual pupil. Nearly every school keeps records of each pupil from the time he enters the kindergarten or first grade until he leaves school. The use which the supervisor makes of such records will determine to a large extent whether he is meeting at least one of the requisites of the scientific method, namely, collecting and making use of all the facts pertinent to the question at hand. Under school records are included the following: promotion, marks, attendance, conduct, age-grade, age-grade progress, physical records, psychological records, achievement on objective tests, and emotional stability.

Promotion. Cumulative records[12] showing the school progress of each pupil are available in some form in the school office. Among these records are those which show the number of times he has been promoted. A study of such records of all pupils in a school will reveal two things to the supervisor. First, it will indicate the general policy of the schools toward promotion. If

[10] Maller, J. B., "Economic and Social Correlatives of School Progress in New York City," *Teachers College Record*, XXXIV (May, 1933), 655-670.

[11] Collings, Ellsworth. *An Experiment with a Project Curriculum*. New York: Macmillan Company, 1927.

[12] Moehlman, Arthur B., *Child Accounting*, p. 101. Detroit: Friesema Bros. Press, 1924.
Heck, Arch O., *Administration of Pupil Personnel*. Boston: Ginn and Company, 1929.

the promotion rate is low, the supervisor will know that in general the teachers in that school hold rigidly to high academic standards and that the school has in all probability not adjusted its standards to the individual capacity of pupils. But the converse may not be true if the promotion rate is high. Second, regardless of the policy of the school, a study of the promotion records will reveal to the supervisor the number of pupils who have been experiencing failure. In either case, a study of the promotion records makes it possible for the supervisor to know the conditions in the school as they exist. Furthermore, a comparison of annual promotion records will show whether any change in school policy with regard to promotion is taking place and the direction and amount of the change, if any.

Marks. School marks are usually recorded one or more times a semester. These marks are in the school office available for the supervisor to study to determine whether an individual pupil, a class, a school, or a city is receiving the same relative ratings in school work from year to year. Unreliable as school marks frequently are, they are the teacher's estimate of pupil progress, and often form the only basis by which growth is made known to the pupil and to his parents. Marks are frequently sent to a new school when a pupil transfers to that school and thus become a part of the pupil's credentials. This is particularly true in secondary schools. School marks have been used in studies[13] to evaluate methods of instruction, the effectiveness of class size, and teacher efficiency. Then, too, school marks provide an opportunity for the supervisor to see whether changes in school policy or in instructional programs of the school are reaching the pupil in the record of his work. However, school marks should be considered only as one means of evaluating the supervisor's program and its effect on pupil growth.

Attendance. Regardless of the system of child accounting used in the schools, some record is kept of the attendance of each pupil. Such records will reveal to the supervisor how often the pupil is coming in contact with the instructional program. Unless

[13] Cornman, Oliver P., "Size of Classes and School Progress," *Psychological Clinic*, III (December 15, 1909), 206-212.

a pupil is in school, the instructional program can have little effect upon him.

Attendance records show to some extent at least whether the pupils come to school because they enjoy being there or whether they are coming simply because the attendance officers are active. Studies have shown that where school work is agreeable, the work of attendance officers tends to diminish. Care must be taken, however, in interpreting the results shown by attendance records. It may be that an epidemic, such as colds or influenza, has caused pupils to stay out of school, or it may be that new methods of keeping attendance records have been put into effect. Furthermore, transportation facilities to schools may change and make attendance easier. All of these factors must be considered in interpreting the data on pupil attendance. Conclusions drawn from the meaning of such records should be postponed until all the interrelated factors have been considered.

Conduct. A review of the literature on the purposes of schools shows that most people agree, in theory at least, that the instructional program of the schools should exert a positive influence upon the conduct of pupils. However, there are differences in point of view as to the meaning of the term "conduct."[14] It is used by some to include all that a pupil does under different situations both while he is in the classroom and while he is in the community away from school. It is also used to apply only to so-called behavior in the classroom. Regardless of the meaning attached to the term, schools have found it desirable to keep records of conduct of pupils. Educators have found that certain records of conduct can be used to throw some light on the degree to which the instructional program affects the lives of pupils. Collings,[15] in measuring the effectiveness of a project curriculum, considered change of conduct in pupils one of the important outcomes on which to make comparisons in his experimental schools and his control schools.

Records of behavior problems have been used to make individual case studies. Some teachers and principals have even

[14] Symonds, Percival M., *The Nature of Conduct.* New York: The Macmillan Company, 1928.

[15] Collings, Ellsworth, *op. cit.*, p. 269-273.

kept records to show the number and kind of disciplinary measures used each day of the school year. From the records which are kept, the supervisor will be able to determine in part the general effect of school life on the activities of pupils and the attitude of the pupils toward the schools.

Age-grade. A survey of the age distribution of pupils in each grade will reveal facts about which the supervisor needs to be informed. Such a distribution will show the percentage of pupils who are retarded and of those who are advanced for their grades. Usually age-grade tables show that a much larger percentage of pupils are retarded than advanced, at least in the lower and middle grades. A study of such tables will indicate whether the activities for a grade are in keeping with the age levels of the pupils within that grade. Obviously, activities suggested for pupils eight years of age are not of vital interest to pupils three or four years older even though they are in the same grade.

For these reasons care must be taken in the interpretation of the age-grade reports. If the work within a grade has been adjusted to meet the needs of different ages within that grade, then there may be no disadvantage, aside from a social disadvantage, in a wide spread of age levels within a grade. If, however, the activities and experiences provided in a grade are narrow in range, they will meet the needs of the pupils less well than if the range of activities is wide. Thus the supervisor can appraise, to a degree at least, the grade placement of activities and the general worthwhileness of his program.

Age-grade-progress. In addition to a study of age-grade records, the supervisor should study the age-grade-progress[16] of the pupils throughout their school life. Such records may be obtained from age-grade reports and from the promotion roll. If the ideal is to have a pupil in grade at age each year of his school life, non-promotion must reach a minimum. Age-grade progress records will show the number of pupils who have repeated a grade's work somewhere. From such data, the supervisor will be able to determine in part whether the instructional program is meeting the needs of the pupils.

[16] Moehlman, Arthur B., *op. cit.*, p. 99, 148.

Physical records. Nearly every school today keeps records of the physical[17] condition of each pupil. The records kept vary from one community to another, but nearly all have records of major physical deformities of pupils and the status of their hearing, eyesight, speech, teeth, and tonsils. A study of these records will show whether the pupil is atypical. Unless adjustments in the curriculum are provided for children having certain defects, the program is not meeting its obligation to all the children nor adjusting the activities to meet their needs. It goes without saying that many of the activities provided in the classroom or on the playground are unsuited to some pupils. Even such minor adjustments as the seating arrangement of the room to provide for children having defects in hearing or sight cannot be overlooked if the instructional program is to be effective.

Psychological records. No appraisal of an instructional program can be complete without some knowledge of the general and special capacities of pupils. Usually these records[18] are secured by the use of so-called intelligence tests. The planning and carrying out of a program of psychological testing is in itself a task which requires a great deal of special ability in the administration and the interpretation of data collected.

Intelligence tests show the supervisor the range in mental ability of pupils in the classes. The differences among pupils are often expressed in such terms as dull, average, and bright, or in terms of mental age and intelligence quotient. Both group tests and individual tests should be used.[19] The group test is less reliable but can be applied to all pupils. The individual test is more satisfactory but is too expensive to use generally.

Some of the best known group intelligence tests are Dearborn Group Test of Intelligence, Detroit First Grade Intelligence Test, Detroit Advanced Intelligence Test, Haggerty Intelligence Examinations, Illinois General Intelligence Scale, Kuhlmann-

[17] *White House Conference on Child Health and Protection.* New York: Century Company, 1932.

[18] Hildreth, Gertrude H., *Psychological Service for School Problems.* Yonkers-on-Hudson, N. Y.: World Book Company, 1930.

[19] Wentworth, Mary M., *Individual Differences in the Intelligence of School Children.* Harvard Studies in Education, Vol. 7. Cambridge, Mass.: Harvard University Press, 1926.

Anderson Intelligence Test, National Intelligence Test, Otis Self-Administering Test of Mental Ability, Pressey Classification Test, and Terman Group Test of Mental Ability.

For individual testing, various revisions of the Binet-Simon Test are widely used, the best known being the Stanford Revision, Kuhlmann's Extension, and the Herring Revision. The following tests are also used: Pintner-Paterson Performance Test, Ferguson Form Board, Merrill-Palmer Performance Test.

The procedure for planning, administering, and collecting the data from intelligence tests may be similar to that outlined for achievement tests earlier in this chapter. Intelligence tests usually are administered by persons trained especially for the task, rather than by regular classroom teachers. In interpreting the results, care must be exercised to get a complete picture of the situation. Often it will be found that pupils who rate low on a general intelligence test may have special aptitudes which help them to succeed in certain school situations or in certain activities of the classroom, while others whose general intelligence is high may be unsuccessful in similar subjects and activities.

For this reason, prognostic and aptitude tests should be provided to measure potential aptitude or ability in a subject. Such tests have been developed for a number of subjects at the high school level, especially in the languages and vocational subjects. Prognostic tests which are used in a number of high schools in the country are intended primarily to predict success in some subject. The Orleans Latin Prognosis Test is of this type. Aptitude tests are designed to measure the underlying ability essential to success in a particular field. The Stenquist Test of Mechanical Aptitude is an example of this type.

Achievement test records. In many school systems in the country today achievement tests have become a part of the regular instructional program and as such are given once or twice a semester. The data secured from these achievement tests are usually recorded on the cumulative record cards.

Thus, there are available for the supervisor objective data to be used in appraising the progress which pupils have been making. These data may be consolidated and should form a part of

the continuing self-appraisal which is carried on in many schools. Since any change in the instructional program is expected to have its effects in the achievement of pupils, the supervisor should make the maximum use of such records.

Care must be exercised in the use of achievement test records.[20] Such records are usually quite reliable but they are only facts and as such must be carefully interpreted. Frequently the testing program in a school changes. New tests are added and new forms used. For this reason the score in a particular subject may not be comparable from year to year. Nevertheless the tests which have been used for the longest period of time and have remained constant in both content and directions for use, usually furnish the most reliable data on pupil achievement.

Emotional stability. The records of emotional stability[21] are less easily obtained from school records than are some of the other records just discussed. The supervisor may need to prepare forms on which to collect such information. These forms may be sent to each teacher asking her to record evidences among the pupils of such things as feelings of inferiority or insecurity, instability, fear, over-dependence, negativism, and unfavorable attitudes toward school or home. Wickman[22] has shown how teachers vary in their evaluation of such characteristics of pupils. Although care must be used in making interpretations of such data, the results of the studies made in this field show that evidently teachers should be giving more attention to the emotional phase of the pupil's life than they have in the past. Only with the knowledge of all such factors can the supervisor and the teacher adjust their programs to meet the needs of the different pupils.

Community Response as a Mode of Appraisal

No appraisal of an instructional program is complete without a knowledge of the way in which the community responds to

[20] Moehlman, Arthur B., *op. cit.*, p. 50.

[21] *The Child's Emotions*, Proceedings of the Mid-West Conference on Character Development. Chicago: University of Chicago Press, 1930.

[22] Wickman, E. K., *Children's Behavior and Teachers' Attitudes.* New York: The Commonwealth Fund, Division of Publications, 1928.

the educational program of the schools and of the support which the community gives to that program. In fact, educators will agree that if the influence of the schools does not reach beyond the classroom and affect the lives of pupils in the community, the schools are not serving the best interests of the people and therefore they have fallen short of their responsibility. Furthermore, if the taxpayers are convinced that the instructional program of the schools is not an asset to their community, they will not give the financial support necessary to carry on that program. Thus the community gives an immediate appraisal of the program which may not be based on all the facts. The attitude of the school patrons which results in such action is seldom formed suddenly, but rather it is the result of a slow development. The supervisor can do much to help discover the reasons for such an attitude and thus to bring about conditions that will change the attitude.

Statistical evidence of the community response to the educational program may be obtained from the use of those methods employed by the Lynds in their study of *Middletown*,[23] or by the use of those methods recommended by Smith and White.[24] Among these methods will be the use and interpretation of records of percentage of literacy in the town, the number of registrants voting, the use of libraries and other cultural organizations, the police and court records, the participation of pupils and adults in community enterprises, such as community chest, clean-up and paint-up programs, and the attitudes of newspapers, parents, churches, parent-teacher associations, and other organizations.[25]

Literacy. The United States census statistics[26] show the percentage of literacy in each community. Such records should be of interest to the supervisor in finding the educational level of the people outside of school. Of course, care must be taken in

[23] Lynd, Robert S., and Lynd, Helen M., *Middletown.* New York: Harcourt, Brace, and Company, 1929.

[24] Smith, T. V., and White, Leonard D., *Chicago, An Experiment in Social Science Research,* p. 90-112. Chicago: The University of Chicago Press, 1929.

[25] Collings, Ellsworth, *op. cit.,* p. 269-283.

[26] *Fifteenth Census of the United States,* III, Parts 1 and 2. Washington, D. C., U. S. Bureau of the Census, 1930.

interpreting such statistics, because the shift of population from one center to another may change the complexion of the community within a very short time. In any case, the facts thus collected are valuable in describing the situation as it is. Whatever condition exists, the supervisor will frequently find it difficult to raise the average level of the pupils much above the average level of their parents.

Voting. The percentage of qualified voters taking part in elections is some indication of the general interest which the community shows in questions pertaining to government. A study of such records will reveal to the supervisor the questions which people in the community are interested in solving and it will also show the degree of responsibility which the people assume in carrying out their obligations in a democracy. The supervisor may find that the community is very active in these respects or he may find that the schools have not taken the lead they should in urging people to participate in government. Again, a study of the facts will help the supervisor become acquainted with the situation.

Public libraries. Public libraries usually keep records of the circulation of books and the services which the library renders. A study of the records over a period of time will show the supervisor whether the community is availing itself of the opportunities offered. Comparable data may be secured in other cities which will be of use in making this kind of appraisal. One study[27] has shown that typical adults in cities read two or three newspapers and two or three magazines regularly and, in addition, about eighteen books a year.

An example may show how such an appraisal can be made. A study was undertaken to compare the number of books circulated in the public library in Detroit[28] with reference to the population now as compared with the situation a number of years ago. The population of Detroit in 1880 was 116,000. The number of books circulated by the Detroit Public Library that year was 117,000,

[27] Gray, William S., and Munroe, Ruth, *The Reading Interests and Habits of Adults*, p. 10-21. New York: The Macmillan Company, 1929.

[28] *Course of Study in Reading*, p. 322-323. Board of Education, Detroit, Michigan, 1931.

or about one book per person. By 1925 the population had increased to 1,242,044, and the book circulation had increased to 3,780,000, or about three books per person. Thus the circulation of books in Detroit grew three times as fast as the population in the forty-five year period from 1880 to 1925. From these facts it would appear that instruction in reading has influenced the reading habits of Detroit's population.

Police and court records. With the establishment of more uniform police and court records,[29] it is now possible for a supervisor to make use of these records in appraising the instructional program. Even yet, such records cannot always be taken at their face value, because records still differ from city to city. However, some indications may be secured which will be helpful not only in comparing one community with another but in comparing one section with another section in the same city. Again, before any conclusions can be drawn from such records, all the related facts must be gathered. For example, in Minneapolis the court records showed that in one area of high social and economic standards the number of cases referred to the police was much larger than in another area of lower social and economic standards. At first it was thought that a higher rate of crime existed in the better of these two communities. On closer examination of the facts, it was discovered that in this community all misdemeanors were reported to the police and arrests were made, whereas in the other community only offenses approaching a major crime were reported to the police and even then arrests were not always made. A study of such records can reveal something of community standards[30] and of the effect of the instructional program on the standards.

Community enterprises. Many other records showing the community response to the school program can be collected and interpreted. The supervisor may well keep informed concerning the degree to which business men and others in the community participate in community enterprises. Often such activities as

[29] Committee on Uniform Crime Records, *Uniform Crime Reporting.* International Association of Chiefs of Police, 1929.

[30] Reckless, Walter C., *Vice in Chicago,* p. 164-197. Chicago: The University of Chicago Press, 1933.

clean-up and paint-up weeks are a direct reflection of the support given to these enterprises by the schools. In any case, they indicate more or less the application of the school program in the community. If pupils themselves are willing to serve the community, they will gain the respect of the parents and school patrons and will influence parents in their attitudes toward community projects. In one town the high school pupils went out after school and picked up all waste paper and rubbish from the vacant lots and helped in making the streets more attractive. In another community, McAndrew[31] reports that an effort was made to have pupils observe Hallowe'en in a more dignified manner than had been the custom previously. The program sponsored by the schools saved the community a great deal of needless expense.

Attitudes of newspapers and community organizations. The supervisor who is alert to the attitude of the community will study the editorials and the news items in the newspapers to see whether, in the eyes of the press, certain parts of the program have been neglected and others have been over-emphasized. In the same way the supervisor should be alert to the attitude toward the schools as expressed in churches, labor unions, boards of commerce, clubs, and parent-teacher associations.[32] All suggestions should be seriously considered and an effort made to inform the public concerning the situation as it exists, and to make such changes as may appear to be necessary.

Summary Evaluation

Appraisal is essentially a comparison of conditions as they exist with some standards agreed upon. The supervisor must discover and make use of all the facts that help to make the description of the total situation complete. If he has a scientific attitude, his final evaluation of the instructional program will be postponed until all available facts have been collected and interpreted. Even then, he will keep his mind open to new facts,

[31] Chicago, Department of Education, *Annual Report of the Superintendent of Schools for the Year Ending June 30, 1926.*

[32] Zorbaugh, Harvey Warren, *The Gold Coast and the Slum*, p. 182-199. Chicago: The University of Chicago Press, 1929.

additional evidence, and more truth. He will recognize that all facts are not of equal importance and that the same fact may have greater importance in one situation than in another. Furthermore, he will recognize that the standards set for one community may be entirely inadequate in another community and that even the standards for one child may not be appropriate for another child. What then can the supervisor do to make a final evaluation of the instructional program? The Fourth Yearbook of the Department may be helpful to the supervisor in his attempt to answer this question. Chapter II of that yearbook states: "Evaluation is the judgment of the worth of the item as a whole, with reference to some adopted purpose. Such a judgment is built up from independent judgments on the separate characteristics of the item by combining them on the basis of an adopted plan of weighting."

After the supervisor has collected evidence from the sources suggested earlier in this chapter, he must proceed to combine the pertinent facts so that he has a basis for action. Each bit of evidence should be weighted first on its importance and second on the validity and reliability of the evidence.[33]

On the basis of the evidence collected and the final evaluation of the evidence, changes can be made in the instructional program or in any portion of that program. At any rate, new facts will have been discovered which can be used as a basis for stating new hypotheses and setting up a plan to evaluate such hypotheses.

[33] For further discussion of this point, see *The Evaluation of Supervision*, Fourth Yearbook, Department of Supervisors and Directors of Instruction, N. E. A. New York: Teachers College, Columbia University, 1931.

CHAPTER VI

HOW TO USE THE SCIENTIFIC METHOD IN THE PROMOTION OF TEACHER GROWTH

BEFORE YOU READ THE CHAPTER. Many means are used by supervisors in stimulating and guiding teacher growth. Undoubtedly some means are more effective than others; some ways of carrying on each procedure are more effective than others. This chapter cannot state with any degree of finality which procedures are most scientific and most worth while. It does offer suggestions, however, as to ways in which the spirit of the scientific method can be incorporated in plans for promoting teacher growth.

Analysis of supervisory practices reveals little if any evidence of the application of scientific method to the promotion of teacher growth. There are indications that supervisors are increasingly cataloging the factors which contribute to teacher growth and are attempting to develop specific techniques for emphasizing these factors instead of continuing to stress general, and perhaps vague, programs for the improvement of teachers in service. These indications point to what seems to be a movement in the right direction. Nevertheless, in any discussion of the means to the promotion of teacher growth by scientific methods, it must be admitted that there is not much objective evidence as to the best procedure.

In this chapter, therefore, it is proposed to discuss the promotion of teacher growth in terms of planning in accord with the principles of scientific method rather than in terms of studies which point the way surely. Broadly the problem calls for planning at two distinct but related stages: (1) planning a program for promoting growth of teachers in service; (2) planning the means by which to make the program effective. Each of these will be developed in turn.

Steps in a Program for Promoting Growth of Teachers in Service

In building a program for the promotion of growth of teachers in service there are several important steps. First, the supervisor must face the problem of developing in teachers attitudes which are favorable to growth. Second, because for the present at least a teacher's growth is probably best measured in terms of his pupils' growth, the supervisor must lead in selecting the distinctive characteristics of such teaching as results in optimum pupil growth. Third, the supervisor, working in coöperation with principals and teachers, will begin to collect data upon which to appraise the program. Fourth, the supervisor, still working with principals and teachers, will study the products of learning with a view to further improvement.

The problem of attitudes. A supervisor who approaches the problem of promoting teacher growth will assume that all teachers can improve provided they wish to improve. This desire to improve can be stimulated in a measure through the wise use of incentives by all types of supervisory officers. Since the supervisor is a teacher of teachers, he must arrange as many situations as possible which offer incentives for improvement.

Perhaps the first incentive for the teacher is a reasonable faith in the educational program he is helping to develop. To have this faith the teacher, as a rule, must have a share, directly or indirectly, in the selection of the objectives of the educational program. A sympathetic insight into the objectives can come only through some responsibility for setting up the goals to be sought. These statements are not meant to urge the presence of all teachers on committees, which would be manifestly impossible, but rather to emphasize the importance of having each teacher pass mentally through the process of developing objectives. The teacher needs the mental security which comes from "seeing the way" with some clearness, and having faith in final goals.

Another condition precedent to a favorable learning attitude on the part of the teacher is the mind-set created by the possi-

bility of undertaking newer methods. Most teachers, of course, desire to improve, but many find it difficult to accept newer objectives or to try other methods, for fear that they will not be as successful as they have been in the past. Also, if a gradual understanding and acceptance of new situations on the part of the teacher are to be brought about, time enough must be taken for the teacher to orient himself on the new level. Those who seem slow or loath to make the change in attitude may need to learn in terms of the success of their more venturesome colleagues who have already taken the step.

The next mental step for the teacher is to be willing to experiment in the classroom under the guidance of the supervisor. This step not only involves revision in methods on the part of the teacher but also necessitates a plan for fact-gathering, as data will have to be assembled gradually if any valid conclusions are to be drawn about the success of the learnings under investigation. The teacher, when he finds himself experimenting and fact-gathering, will want to know the results of similar investigations and will look to the supervisor for guidance. This situation can be met only if the supervisor is ready to draw on his own experience in scientific investigation and has an extensive bibliography on the subject ready for use. When a supervisor has led a teacher to a general interest in experimentation, and more specifically has led him to deal with facts rather than opinions, to select the proper criteria for judgment, and to be willing to face the findings, then a favorable learning attitude may be said to have been developed. Along with such a mental attitude on the part of the teacher should come the desire to have available scientifically prepared courses of study, stimulating supervisory bulletins, and scientifically prepared teaching materials.

The supervisor will find it helpful also to consider other proposed classifications of desirable incentives which may be used. Thus Reavis, Pierce, and Stullken[1] list the following incentives to teacher growth: professional recognition, professional advancement, opportunities for unique service, salary increases, challeng-

[1] Reavis, W. C., Pierce, P. R., and Stullken, E. H., *The Elementary School*, p. 334-354. Chicago: University of Chicago Press, 1931.

ing school environment, encouragement in classroom experimentation, delegation of professional duties, mass attack on professional problems, opportunities to do creative work, stimulus of a professional library, development of scientific attitude, and membership in teachers' organizations.

Objectives in Teacher Growth

Because the purpose of any supervisory program is to secure pupil growth, the ultimate effects of instruction must be kept in mind in the planning of any program centering upon teacher growth. The objectives for teacher improvement must be found in the forms or techniques which characterize teaching that results in pupil growth. From various sources the following objectives for promoting teacher growth have been assembled. They have not all been determined scientifically—rather they constitute working hypotheses. They are arrayed here as characteristics of the teacher whose work with pupils produces the desired development.

1. *Possession of a philosophy of education.* Bonser[2] has stressed the need on the part of the teacher for the possession of a philosophy of education which will emphasize a progressive conception of the educative process. Clearly, there is need for the teacher to formulate his own individual philosophy of education. All too many teachers accept devices from current magazines or from associates without questioning in any way whether or not they are in accord with the principles from which these practices have been derived. A supervisor needs to emphasize and reemphasize the point that a teacher should not accept another's judgment without subjecting it to the criticism of his own thinking.

2. *Not only knowledge of but skill in applying psychological principles.* Lessenger,[3] in a controlled experiment designed to combine improvement of teachers in service with motivation of children's work, made use of three teachers, two of whom were

[2] Bonser, F. G., *Life Needs and Education.* New York: Teachers College, Columbia University, 1932.

[3] Lessenger, W. E., *Motivation and the Accomplishment Quotient Technique.* Ph.D. Dissertation, State University of Iowa, 1925.

new and one of whom had had some experience and had been rated excellent. The two new teachers had been carefully selected and trained. The emphasis was placed upon reading for the whole school year. Following the use of a battery of tests—intelligence, general achievement, and reading—at the beginning of the school year and informal tests at intervals of six weeks, the teachers were given the responsibility for improving reading by applying psychological principles to the formulation of worthwhile reading experiences. Decided gains were made during the year as measured by test results.

3. *Acquaintance with and the ability to use the techniques of fact finding, curriculum making, and research.* The development of these tools may be secured by means of coöperative experimentation such as is proposed in Chapter IX with respect to the selection and preparation of instructional materials or in repeating experiments for which the techniques have been clearly outlined, as a means of checking the truth of the original conclusions. Chapter VII includes illustrations in which teachers have made such contributions.

4. *Knowledge of the scientific method to be used to diagnose success or failure of classroom learning, both individual and group.* Experiences with diagnosis should enable the teacher to develop some degree of skill in the application of scientific method to it without the specific guidance of the supervisor. Monroe[4] outlines a very detailed method for diagnosing specific difficulties of children who cannot read and recommends definite types of help to be given them. All educational diagnosis needs to be as fully and completely made.

5. *An understanding of children's behavior, means of growth, and needs in terms of basic values.* Wickman[5] in his study showed that teachers improperly evaluate children's behavior as to its seriousness, at least when compared with psychiatrists. Teachers do not consider the shy child a problem. Rather, they consider the child a problem who manifests an attacking type of

[4] Monroe, Marion, *Children Who Cannot Read; The Analysis of Reading Disabilities and the Use of Diagnostic Tests in the Instruction of Retarded Readers.* Chicago: University of Chicago Press, 1932.

[5] Wickman, E. K., *Children's Behavior and Teachers' Attitudes.* New York: The Commonwealth Fund, 1928.

behavior. As to the third item, "needs in terms of basic values," the present stress placed upon children's *interests*, while valuable and necessary, should not displace children's *needs* as a basis for the selection of experiences.

Collecting Data for Appraisal

After the objectives have been set up, the next consideration is the scientific collection of data by the supervisor in coöperation with principals and teachers. The types of data to be secured should be closely related to the objectives set up. Problems should be sufficiently practical so that principals and teachers may readily see how such studies can result in the improvement of the teaching act. The data should be secured objectively through check lists, tests, scales, diaries, stenographic reports, questionnaires, records of units of work, and other specific means. The data secured should be accurate and checked with sufficient care to insure the validity of the conclusions. Observable factors, such as attention, promptness, and cleanliness, may be measured by the teacher and pupil working coöperatively, making the first check-up as an inventory and the second as an achievement measure.

For the present, at least, teacher growth is probably best measured in terms of pupil growth. At the present time standardized tests are the most widely used yardsticks for determining such growth. Most of those in general use measure chiefly the acquisition of knowledge and skill. Relatively few of them measure the so-called intangibles, the concomitants of learning, such as coöperation, initiative, and reliability. However, as was pointed out in Chapter V, such tests are becoming increasingly available and should be used more generally as means of collecting data for appraisal.

Studying the Products of Learning to Discover Elements of Strength and Weakness

As the supervisor, working with principals and teachers, approaches the problem of interpreting the results of educational measurement, he will look first for evidence of good work

worthy of commendation. However, if teacher growth is to be promoted by this study, some attention must be given to poor work and its causes. Especially is it important for the teacher to discover causes which he himself can influence. For example, "teacher personality" can be improved provided the teacher knows which traits need improvement and the relative importance of these particular traits in teaching success. The Commonwealth Teacher-Training Study[6] presents a list of twenty-five traits which are attributes of the good teacher. Objective measures built upon such a list and applied from time to time in specific situations are necessary in order to provide incentives for growth.

There are, of course, many causes which contribute to a summary judgment of "poor work" in interpreting test results. A few which are frequently found are discussed here as a beginning from which the supervisor may work.

1. Poorly adjusted instructional method. It is always desirable, in searching for causes of poor school work, first of all to make certain that the pupil's lack of response is not due to poor teaching methods rather than to difficulties inherent in the pupil himself. The teacher can do little to affect the pupil's intelligence, his home environment, or his aptitudes, but he can help the pupil to use his native ability to the best advantage. The teacher can improve or develop from a small beginning good study habits, desirable character traits, emotional control, motor control, and various types of interests and skills. An experiment such as that conducted by Phillips[7] to discover the nature and extent of reversals in reading and closely related activities, made by right- and left-handed children, should serve to help teachers see that although left-handed children make no more reversals than right-handed children, there are problems of handedness which require differentiation of method in fields other than handwriting.

When pupils in a given group fail to respond to a learning

[6] Charters, W. W., and Waples, D., *Commonwealth Teacher-Training Study*. Chicago: University of Chicago Press, 1929.

[7] Phillips, Albert J., *Left Right Dominance and Disability in Reading*. Ph.D. Dissertation, University of Michigan, 1933.

situation, and when intelligence tests show that they are capable of learning, it is time for the teacher to take stock of his teaching procedures to find what he has done that hinders learning, or what he has not done that would facilitate learning. Kyte,[8] in his study of problems faced by rural school teachers, asked them to classify their serious difficulties as (1) unsolved problems, or (2) difficulties they believed they had overcome. When the returns were in, it was found that the items classified under problems of classroom instruction were most frequently checked, with the item "keeping children profitably at work in class" receiving more checks than any other. The major problems under classroom instruction were classified as those concerned with (1) planning teacher's own time, each grade's schedule, and each pupil's time; (2) methods of teaching, including modification of school work to provide for teaching by activities and correlating subject matter; and (3) skill in specific phases of the teaching act, such as the art of questioning and the making of assignments. Supervisors in other fields may well use these actual, reported problems as a basis for supervisory programs leading to teacher growth.

2. *Conflict of purposes.* Causes for poor work may also exist in the fact that the purposes set up by the teacher either conflict with pupils' purposes or do not serve them at all. Children who are interested in making an aquarium and find that avenue of interest stopped because they are required to study ancient peoples will be aware of conflict as to purposes. Students who study physics from a textbook without being led to an awareness of how its principles function in real life, will see little if any purpose in their study.

3. *Inadequate learning situations.* The causes of failure may also lie in the fact that conditions suitable for pupil growth have not been provided. The laws of readiness, exercise, and effect, although accepted in theory, are frequently disregarded in practice. For instance, among the numerous studies in recent years that have been made of children's interests in the field of reading,

[8] Kyte, George C., "Problems Rural School Teachers Are Facing," *The Nation's Schools,* XI (April, 1933), 23-28.

the studies by Jordan,[9] Cavins,[10] and others show that children's interests have been violated in the selection of reading material. Usually materials have been selected by an adult without reference to the pupils' interests. Cavins concluded, as a result of his study, that the poems used in his experiment had been placed from two to three grades too low in courses of study as measured by children's ability to understand them. Other studies have been made as to the grade placement of materials and of units of work in other subjects. There is always need for the supervisor to question earnestly whether the local course of study and the regular instructional aids provide properly adjusted and adequate learning situations for pupil growth.

4. Physical environment. A satisfactory physical environment is essential to good work and failure to provide it may result in poor work. A study by Butsch[11] of the relation of ventilation to pupil health used measurement in terms of the number of absences due to respiratory illness. The results showed that children in naturally ventilated rooms had a lower percentage of respiratory illness than those in mechanically ventilated rooms. This factor cannot be as easily controlled by the teacher as can that of seating. Bennett[12] has shown that seats set at an angle to the source of light make it possible for all to have the benefits of correct lighting.

5. Administrative arrangements. The administrative set-up with its provisions for pupil classification, grading, and promotion offers an important reason for failure unless it does provide very definitely for individual differences. Buckingham[13] reports a study by McKinney at Springfield and Decatur, Illinois, in which 1,276 pupils were marked as failures. Teachers were directed to advance all pupils on probation for six weeks, thus

[9] Jordan, A. M., *Children's Interests in Reading.* Teachers College Contributions to Education, No. 107. New York: Teachers College, Columbia University, 1921.

[10] Cavins, L. V., *Standardization of American Poetry for School Purposes.* Chicago: University of Chicago Press, 1928.

[11] Butsch, Russell L. C., "A Comparative Study of the Effects of Different Types of School-Building Ventilation on the Health of Pupils," *Elementary School Journal,* XXX (September, October, November, 1929), 16-26, 123-31, 208-17.

[12] Bennett, H. E., *School Posture and Seating: A Manual for Teachers, Physical Directors, and School Officials.* Boston: Ginn and Company, 1928.

[13] Buckingham, B. R., "An Experiment in Promotion," *Journal of Educational Research,* III (May, 1921), 326-335.

placing responsibility for success on the receiving teacher. Seventy-five per cent of the 1,276 pupils made good during the first report period, 75 per cent the second report period, and 63 per cent the third (illness interfered). At the end of the semester, 1,087 or 85 per cent of the probationers were promoted, this time without question. A comparison of the average scholarship for the semester preceding the experiment (80.4) with that at the end of the first semester of the experiment (81.1), and with that at the end of the second semester (82.2), seems to indicate that the quality of work was improved by such a program.

A further study by McKinney of the quality of work done by repeaters indicates that 35 per cent of repeaters did better the second time, 53 per cent made no improvement, and 12 per cent did poorer work. A comparison with Keyes'[14] findings shows corresponding percentages of 28, 36, and 37.

Planning the Means by Which to Make the Program Effective

How is the supervisor to adjust his program for the promotion of teacher growth to the actual needs of his teachers? The quickest and the most unscientific way to bring about a change is to call a large group of teachers together and tell them what changes are to take place. A favorable mind-set is probably not likely to be developed in this manner. In the past the most common kind of supervision has been the mass type, just as the classroom teaching has been of this variety, but there will be much agreement with those who say that such supervision has been only moderately successful. There are mass or group methods, however, which seem fitted to some situations and to the needs of considerable bodies of teachers.

Meeting Group Needs

Teachers' meetings. Problem: How can teachers' meetings be set up scientifically so as to meet the needs of all or most of the

[14] Keyes, Charles, *Progress Through the Grades of City Schools; A Study of Acceleration and Arrest.* Teachers College Contributions to Education, No. 42. New York: Teachers College, Columbia University, 1911.

teachers and at the same time help the school to realize its objectives?

Teachers' meetings must be concerned with the general problems of the school as well as with classroom and learning situations. Problems of the former type are usually called administrative problems and the latter, supervisory. Under administration come the machinery of the school or system in making it an effective organization, the extra-curricular activities, and the problems which have to do with improving morale through increasing the degree of student participation. Under supervision may be considered those things which contribute to the improvement of learning. With this definition of supervision in mind, the teachers' meetings will have to do largely with the learning process, although the school principal in his capacity as administrator will need to give some time to administrative problems.

It is presumed, in discussing supervisory teachers' meetings, that the supervisor is making a continuous survey of the success of the learnings going on under his care, and that from data available he has assembled problems of significance either to the whole body of teachers or to special groups. There may be a lack of clarity as to some of the objectives, or a need for restatement because recent experimentation has caused educational leaders to shift their point of view. Another method of securing problems is to send teachers a questionnaire, or otherwise encourage them to propose vital, pressing problems as they see them from their vantage point on the firing line. Such problems to be of help, however, must be clearly and effectively stated. They can be discussed and evaluated, and the most significant ones can be made the basis for further investigation.

After the discovery and statement of the problem comes the organization of the faculty for study. One supervisor said that it was his aim to make his meetings as vital as any course in education his teachers might receive at the university in the same city. Plans for study may be made through committees or by individuals, but the former scheme is more successful and makes use of a greater number of teachers.

In the selection of a problem for general study, care must be taken that its implications are broad and deep enough to have significance for all. Facts must show that there is a real problem. Some teacher may want to see a study made as to why students are worse behaved in school than they used to be, but it is desirable first to find out whether students do behave worse than formerly. It may be that the behavior problem is due to the personality of the teacher.

With the attack upon the problem planned, and the committees assigned to investigate and report its various phases, next comes the work of collecting and classifying the data. Needed facts will often be found in the hands of certain teachers, in the files of the supervisor, or in publications by other investigators. Some facts, however, will be available only after experimentation. Reports may be possible after a short time or much time may be necessary, depending upon the nature and difficulty of the task.

The next steps in problem solving are outlined in Chapter I. From this discussion it will be seen that if teachers' meetings are to be scientific in method they must be purposeful and organized; facts and not conjecture, or opinion, or even authority are to be the basis for further action.

The well-organized teachers' meeting or series of meetings will include:

1. Organization around a central problem.
2. Plans for further activity.
3. Reports of investigation or progress.
4. Discussion of reports and the meaning of data submitted.
5. Attempts at generalizations based upon facts collected.

A true answer to the problem will come, if at all, only after careful checking of data, verification of the results, and thoughtful criticism of the validity of the conclusions. Even then the scientific investigator keeps an open mind on the subject, ready for any new data which may force him to accept different conclusions.

Demonstration lessons. Another form of assistance to groups of teachers is the demonstration lesson. If such a lesson is to be

a success, careful plans must be made, because the whole problem of success in learning is involved. First, the favorable attitude for learning on the part of the teachers is to be considered. Recently a teacher made a report in a class in education in one of our large teachers' colleges, giving his experiences in demonstrating a class activity before his colleagues in a prominent secondary school. His report received the approval of the class of experienced high school teachers, but the prevailing comment was, "If you were in our school, you would not dare to demonstrate before the faculty, for you would never hear the last of it." This was a surprise to the teacher, as demonstration lessons were not infrequent in his school. It must be clear then that the matter of a favorable attitude toward demonstration can be created. If teachers who have diverse interests are to be present, the demonstration must follow principles similar to those suggested for the selection of a subject for a teachers' meeting.

1. The demonstration may well grow out of discussion meetings and meet an expressed need of the group.
2. The teacher selected for the demonstration ought to be chosen after discussion, not because he is the best teacher in the opinion of the supervisor, nor because he has the brightest class, but rather because his classroom is stressing some activity in which the teachers are particularly interested at the time.
3. The teacher must be willing and able to keep himself out of the picture as much as possible, and be ready to demonstrate a favorable learning situation rather than his own skill.
4. The demonstration teacher must be one who can take part objectively in a post-discussion of the value of the activity seen.

The demonstration is then set up after discussion in which all the teachers concerned take part, as well as the supervisor who may have initiated the plan and the teacher who is to demonstrate. A plan is made for the observation so that there will be unity as to what is to be observed, and so that the supervisor and the teacher concerned may know what to prepare.

Teachers may feel the need for help in:

1. Forming the class into a well-organized social group.
2. Organizing group and individual activities in the classroom.
3. Initiating and planning a unit of work.

4. Some particular method or technique, such as a spelling lesson.
5. Conducting a home-room period.
6. Increasing pupil initiative as opposed to teacher activity.
7. Making assignments.
8. The use of teaching materials.
9. Testing the results.

It may be well to see to it that, as the teachers look for definite techniques or methods, they are advised by the supervisor to gather data concerning: the teacher's attitude toward the pupils; the attitude of the pupils toward the teacher and toward each other; the value of the activities; the value of the questions asked.

The important problem for the observers and for the supervisor is the collection of data which may be valid concerning the work seen. As pointed out earlier, scientific observation and conclusions must be based upon objective data.

In general it may be said that the observer must know the objectives of the lesson and must collect valid data about certain features agreed upon in advance. After the lesson, the observers should pool their data, harmonize their interpretations of the data, and draw conclusions as to the value of what they have seen. The supervisor will direct the deliberations and will help to formulate the next step.

Teacher inter-visitation. Another way for the teacher to improve his method or technique is to visit good teachers who have developed some particular phase of classroom procedure to a satisfactory standard, or whose results are successful in measurable degree. Such visits may be made in groups or individually. For teachers in service the visits should be preceded by discussions directed by the supervisor and by special preparation on the part of the teacher. The conference with the supervisor ought to reveal what can be seen during the visit, and usually it is wise to center the observation around a few points. The teacher's preparation should consist of making himself familiar with the subject matter or activities to be investigated and the methods to be used. In an investigation of reading, for example, a preliminary study of one or two authorities would perhaps be the best preparation. The teacher may wish to study methods of

diagnosis of pupil difficulty, remedial methods used, and the place of oral and silent reading in general. He must also be ready and able to secure valid data concerning the work seen, which can be used for evaluation later. After the visit, everyone concerned will doubtless wish to meet with the supervisor and discuss the lesson or activities seen. In general, inter-visitation should be conducted on the same plane as demonstration lessons, and the same scientific preparation for the collection and evaluation of data should obtain.

Group conferences. It is believed increasingly by many supervisors that group conferences of teachers are among the most valuable means of securing teacher growth. Common types of conferences are:

Grade groups
School or department groups
  Primary or elementary school
  Intermediate or junior high school
  Senior high school
Subject matter or activity groups
Committees or special task groups
Guidance groups

The growing tendency to introduce specialization in teaching from the earliest grades in the elementary school has caused the development of coöperative planning among teachers in schools so organized. By this means units of work are planned in group conferences under the guidance of the principal as supervisor, and each teacher of the group is assigned definite responsibility in the development of the unit. Such planning and the resulting activities are among the most fruitful possibilities in the supervisory field. The secondary school offers rich opportunity for planning in those situations where the well-rounded development of pupils is considered more important than formal acquisition of knowledge. For the general supervisor the kindergarten-primary, the intermediate, and upper grades all offer opportunity for group action after plans have been made.

In general, the mode of using the scientific method with group conferences is similar to that with teachers' meetings. The first

step is the discovery and isolation of the problem. It may have its inception in the course of study. It may be one large problem which has been troubling all the teachers of a certain grade. Next, the problem may lead to research or the planning of a unit of work to meet a demonstrated need of pupils.

An illustration may serve to indicate how these steps lead on into productive activity. A group of teachers of the fifth grade brought out in a conference their growing belief that the course of study in arithmetic should be more closely related to the lives of children. Committees were appointed: one, to make a new study of the course to see if this were really true; another, to study new courses of study in arithmetic developed in other cities; a third, to investigate recent research and publications on the subject. Along with this detailed study there was a general study as to the present needs of the children for number, as well as their not too remotely future needs. With the reports of research or study came consideration of what the proposed changes might mean: (1) in the lives of the children, (2) in the class activities, (3) with respect to changes in teaching material, and (4) with respect to expense. The discussion led to plans for experimental teaching with control groups and the careful checking of results. Out of this came recommendations through the supervisor and arithmetic committee to the superintendent for changes in the course of study.

Discussion groups and study groups. Informal discussion and study groups have for their purpose a broadened background, a deeper understanding of educational objectives and methods than teachers, supervisors, and administrators usually have. Educators of every type must be increasingly expert in subject matter and method, and they must be alive to the great social, economic, and moral challenges of the day. Each study group can attack its problems scientifically by undertaking a study of educational objectives and problems of the present day in the light of the existing social and economic structure.[15]

[15] An excellent list of newer worth-while books was published in the *Journal of the National Education Association* for April, 1933. This list furnishes material for study into many educational problems, although intensive investigation would lead to a need for other materials.

It must be admitted that many teachers and some supervisors do not wish to discuss or even contemplate the broader problems of education, especially the philosophical groundwork. Their defense is that they are interested in the practical only, but what this actually means is that they wish others to set the goals for them to follow. The scientific attitude in education implies the constant challenging of goals and continuous modification to meet the advances in thought and changing social, economic, and moral situations.

Bulletins. Supervisory bulletins are usually of two kinds: (1) those which are a part of a planned program for the development of teachers, and (2) those which are written to meet some special or immediate need. The latter type are by far the more common, but they are not necessarily more stimulating or helpful than the former. Scientifically planned bulletins will consider objectives, problems, collection of data, possible solutions, and all the steps which have to do with the discovery of truth and the dissemination of knowledge. This means that the bulletins will be the outgrowth of discussions and the proposals will go no faster than the ground has been prepared.

The bulletins should be carefully prepared and duplicated so that they can be filed for use as the best and most convenient material available for each teacher on the subjects under discussion or investigation.

Lectures. Recently a large group of citizens in a community desired to become better informed about the causes underlying the economic depression and its attendant social ills. To do this they organized study groups and a forum. The study groups met monthly and discussed the problem for the coming forum or lecture. The result of the plan was that several hundred people of all classes became learners, thoroughly alive to great public questions. Some seemed to find the study groups the better learning situation, while others believed the forum of greater value. Both were probably necessary, and plans for another year called for both.[16] Would it not be difficult to suggest a better

[16] Hook, Constance, "The Montclair Economic Forum," *Progressive Education*, X (March, 1933), 150-153.

form of organization for a series of lectures for teachers than the citizens arranged for themselves? The teachers could well undertake a study of present-day social and economic ills and they would be wise to relate it as far as possible to the civic and social life of the community in both its local and broader aspects.

Committees. More and more supervisors are depending upon committees of teachers for certain types of curriculum studies and assistance in preparation of courses of study. As in all activities related to the welfare of the school, the right attitude of mind in the teaching force is essential in order to produce the most growth. Education cannot progress faster than the teachers grasp, accept, and help promote the aims of the school system. Supervision should be creative and scientific, and to be either it should be democratic. If supervision is to create the best learning situation for teachers, it can best do so by admitting them to the largest possible share in selecting objectives which their ability, training, and experience make possible. This applies also to the discovery of the means or routes through which the goals are to be reached.

Types of committees now in frequent use deal with the curriculum, preparation of courses of study, grade activities, investigation of new teaching materials, and revision of supply lists for classrooms.[17] The committees will work scientifically if they seek to find and state the most important problems, seek objective data concerning each, and, as outlined previously, seek the truth through accurate and unbiased investigation. To do this requires capable leadership on the part of the supervisor and intelligent and professional committees.

Exhibits of units of work and textbooks. An important means of improving teachers in service is to exhibit work which shows progress in achieving the aims set up by the schools. This is important for the learning of both students and teachers. Every school and school system can have such exhibits. In one city a large room in the Board of Education building has been set aside for exhibition purposes. It is the task of the general supervisors

[17] For suggestions as to the selection of such committees and their work, see Chapters VII, VIII, and IX.

to see that units are selected from the classrooms and placed in a favorable location in the exhibition room. The great problem of such a room is to keep its contents fresh and up-to-date and representative of the vitality permeating the school system. As soon as such a room is in any measure neglected, it becomes a museum rather than a vital force in the improvement of teachers.

Often, in the same room, there are publishers' exhibits of textbooks for pupils and teachers which are considered especially adapted to the needs of the present day. The books are carefully classified, and an indication of the contribution each has to make to courses of study and activities is usually displayed where the teachers can study it.

Helping the Individual Teacher

On the preceding pages attention has been given to the types of service which the supervisor is able to give to the teachers in groups for the development of further growth. It is now proposed to discuss some of the means whereby individual teachers may be helped most.

Supervisory visits and post-visit discussions. It is assumed that the supervisor will visit the classroom and work with the individual teacher if best results are to be obtained. To be successful in such contacts with the teacher, however, the supervisor must create if necessary a favorable learning attitude on the part of the teacher. The mind-set for the individual must be fully as favorable as with the group. The means for creating this attitude have been discussed earlier in the chapter.

The first step for the supervisor arises from the accumulated data in his hands, or the feeling of need on the part of the teacher. The latter is preferable, especially if the aid requested is centered around some problem of vital significance. If poor results have been obtained, as shown by tests, then the supervisor and the teacher have the problem of finding the cause or causes. This situation is often handled unscientifically by supervisors who may assume that the cause is evident and no further investigation is needed.

The second step is a conference between the supervisor and the teacher, in which the situation is discussed frankly and plans are laid to attack the difficulty by the analysis of some seemingly successful work. Usually such plans will lead to classroom visits by the supervisor, further collection of data and perhaps some experimentation. After these steps will come more conferences, the development of an hypothesis as to the cause of the difficulty, a trial of the hypothesis in the light of the data secured, and the formulation of conclusions.

The following case study has some of the elements of scientific procedure and is well within the possibilities of every well-trained supervisor.

Case study. A successful sixth grade teacher reported to her supervisor that she had been teaching a unit on New England for several weeks and that a test showed that the pupils had gained little. An analysis of the test questions revealed that they were chiefly of the factual or memory type. There were few that required any knowledge of relationships or expression of attitude, and few that had any connection with lifelike situations. The teacher, who was unusually successful in the skill subjects, wished to do as well with the social sciences, and called attention to her knowledge of and adherence to the course of study. The feeling of need and a willingness to discuss the problem were evident.

As a result of this first conference, the supervisor at the request of the teacher agreed to help plan and carry out a new unit on New England to see if the class could be brought to a higher level of understanding.

The teacher presented the matter to the class and the pupils readily agreed to coöperate with the supervisor in the experiment. The supervisor took some time to discuss New England with the class, especially emphasizing it as a neighboring region where some of them went in the summer and where one or two had lived. It was decided to have the class plan a study based upon automobile trips to New England in search of a business location or a place to spend the summer vacation.

To make such a study successful it was agreed that much material would be required. The room contained some modern

geographies and maps, but the class wished automobile maps, pictures, advertisements of industries and summer places, weather maps, and a construction table. Committees were formed to get materials, make investigations, and prepare reports. The pupils, the supervisor, and the teacher planned together the goals and the means of reaching them.

When the time arrived which had been set for the work to near a close and the unit was securing satisfactory responses from most of the class, the supervisor and the teacher again went over the test given previously, upon which the majority of the class had failed. A new test made up of objective questions was devised, based upon the newer interests and learnings. There were seven times as many questions on the new test as on the old, and the teacher agreed that possible learnings were much better sampled than by her former test. A minimum achievement was set by the teacher and she said, "If a pupil can answer enough to reach that score, he must know something about New England." All but three reached the passing mark.

During the work upon the unit there was attention to the improvement of the reports, a shift in the type of question from the factual to the thoughtful, an increased use of activities, and practice in sharp but fair discussion. In this latter phase of the work a great weakness appeared, but in the end the class discussions were on a higher plane. The results showed that the class could learn when the problems were within their experience and interest.

The teacher and the supervisor then went over the course of study in terms of its objectives and made these observations:

1. The course of study did have worthy objectives. The course needed to give more suggestions as to outcomes desired and ways of reaching the objectives.
2. The classroom was not provided with sufficient social science teaching material, but the teacher had not realized this. The course of study could suggest additional materials needed.
3. The teacher realized that although she had developed much ability as a teacher of skills, she had not acquired a background nor a method which would succeed with social science. She needed help beyond the printed course of study.

4. The teacher gained skill during the unit in dividing the time for social science into: reports, planning, research, and testing. Not all these features appeared every day.
5. Less attention was given to the acquisition of factual knowledge and fewer book assignments were made.
6. More attention was given to psychological learning and less to logical.
7. There was better motivation and integration; more reading with a purpose.
8. There were more contacts with the home.

The scientific aspects of this study might be summed up as follows: The teacher by her own testing methods had discovered poor work. She lacked the technique for finding the causes of the poor work. The supervisor, by methods based upon experience and training, discovered that the goals were founded upon the acquisition of abstract knowledge rather than upon the thinking required in lifelike situations. The hypothesis as to the difficulty suggested that the learnings were abstract and logical rather than concrete and psychological.

Coöperative research. It is safe to say that in all phases of education there is much uncertainty at present as to what are the best objectives, what is a proper program of studies, and what are the best methods of learning. Such doubts may be confusing to educators but they stimulate thinking and research. Such a situation leaves a multitude of problems for every school organization to undertake, and although most schools and teachers are not equipped to do research, almost everyone can be reached through coöperative supervisory enterprise. A supervisor, to be efficient, should be familiar with research and experimentation, and teachers must have a part in such investigations if the best results are to be obtained. In democratic supervision the teacher, the principal, and the general or special supervisor sit down together, study the data available, formulate the problems, and plan the steps thought necessary to find the answer, even if it be but a temporary one. Teachers who are allowed to take part in such coöperative enterprises must of necessity grow. Reports of such research are now common.

Professional reading. The supervisor has an important and interesting task not only in keeping abreast of the times himself

in his reading but also in guiding individual teachers to keep up to date. Knowing enough about the trends of the times so that his judgment is sound as to the function of education in life today and tomorrow is a great challenge to any educator. To meet it he must read understandingly a first-class newspaper, periodicals with articles touching all phases of life, and enough of the newer books to be familiar with the thought of the day, running the whole gamut from the extreme conservative to the extreme liberal.

In the field of educational thought and technique he must read broadly enough to know what lines of thought are coming to the fore, and often he must read intensively if he is to be ready to give aid in solving the problems of those who look to him for help. For example: if the supervisor is to lead in the construction of a new course of study in arithmetic, the place of number in our life today is one of the first considerations. Then the needs of children and their mental attitudes toward number and what the child-study laboratories have to reveal must be investigated. The newest educational experiments in teaching number in the classroom and the grade placement must come up for consideration. Finally, the administrators have helpful opinions about what really works.

To know life demands contacts with people and with books. The supervisor must have such experience to make a course of study in any field.

This continual reading of the best material constantly arouses the alert supervisor to see new relationships in life and new tasks for the school. New enterprises are started, new problems are stated, or new light thrown on old problems. "Reading maketh a full man" and tends to make of the supervisor an alert, capable leader.

CHAPTER VII

HOW TO USE THE SCIENTIFIC METHOD IN CURRICULUM STUDIES

BEFORE YOU READ THE CHAPTER. Curriculum studies have received relatively little attention in previous yearbooks of this Department. Yet year by year more supervisory workers are being expected to lead in the revision of the curriculum. This chapter should give such workers an overview of the field. It is written primarily for the consumer of curriculum research, because every supervisor needs to utilize the results of research relating to objectives, method, content, and grade placement. The implication of the chapter is clear, however, that the supervisor who is to be an intelligent consumer must also be, to a degree at least, a producer of scientific curriculum studies. The chapter should be of particular interest to such supervisory agents as superintendents and general and special supervisors who have the entire school community as their field of activity.

Curriculum studies are concerned with the end to be accomplished by the educative process and with the ways and means of accomplishment through content and method, including grade placement. Such studies furnish the framework and material for courses of study, for supervisory bulletins, and for discussions dealing with the problems of what to teach, how to teach, and where to teach it.

The extent to which the supervisor is responsible for directing curriculum studies varies somewhat with the organization of the school system in which he works. In the larger cities, where some subdivision of supervision is necessary, the major responsibility for such studies may be carried by some individual or group of individuals especially prepared to direct studies, and to articulate such changes in the curriculum as may seem advisable in the several divisions of the instructional program. All supervisors, however, play important rôles as advisers in their particular subjects or fields. In smaller school systems, the supervisor frequently carries the entire responsibility for working out de-

sirable changes in the curriculum. Although the degree of responsibility may vary, still in practically all situations the supervisor is both a consumer and a producer of curriculum studies. He must use discriminately the results of published studies and he must frequently supplement what he finds in educational literature with studies of his own.

The Use of the Results of Curriculum Studies

The statement is frequently made that educational practice is from ten to twenty years behind educational theory. This "lag" indicates that, as a whole, those in charge of directing instruction have been poor consumers of the results of educational research. When one considers all who are entrusted with supervisory responsibility (superintendents, principals, department heads, general supervisors, and special supervisors), it is quite obvious that some of the individuals have not the training which will enable them either to use the results of curriculum studies effectively or to conduct investigations scientifically. It is also evident that no small number of supervisors are apathetic or even disdainful of the results of educational research. Although such apathy and disdain usually denote a lack of understanding of how to use such material and lack of skill in scientific method, this attitude is somewhat intensified by the very nature of curriculum studies. The results of curriculum studies are fragmentary and sometimes contradictory. Seldom, if ever, does a supervisor find in the results of the studies which are available a complete solution of any one of his problems. He must bring together truths by a critical reading of many studies. Then, by critical thinking, selection, and evaluation, he must fit together these truths and on this basis build a pattern of action. A plan of action based on even fragmentary truths is superior to anything he and the teachers could devise without such guidance.

The fact that supervisors have looked for ready-made solutions to their problems is due to the misunderstanding of the whole nature of scientific method. Objective study does not, without thought, yield truth either to the one who is conducting the study or to the one who attempts to use the results of such a

study. Scientific method is a refinement of observation and an improvement of the basis on which opinion is formed. Scientific method and philosophic method are not two independent approaches to problem solving, but rather each is correlative to the other.

It would indeed be a poor sociologist or economist who would attempt to outline measures for correcting our present economic difficulties without having, as a basis for his thinking, knowledge of the truths to be gained from surveys of production, consumption, and employment. Likewise, it would indeed be a poor supervisor who would attempt to outline with his teachers a method for improving pupils' ability to solve problems in arithmetic without bringing to the teachers the helps to be found in numerous curriculum studies on how to improve problem-solving ability in arithmetic.

The actual labor involved in gathering material pertinent to supervisory problems has been reduced by the appearance of some excellent summaries of the important research in selected fields, such as those of Gray[1] in reading, Buswell and Judd[2] in arithmetic, Lyman[3] in certain phases of English, and Curtis[4] in general science. In addition to helpful summaries, a new balance-striking type of magazine article is making its appearance. Turney[5] strikes a balance for us on the problems of ability grouping. He reviews most of the worth-while studies of the problem and then sets forth the conclusions which may be drawn on the basis of these studies. These conclusions show clearly what may be accepted as the best information now available on this problem. The publication of the American Educational

[1] Gray, William Scott, "Summary of Investigations Relating to Reading," *Supplementary Educational Monographs*, No. 28. Chicago: The University of Chicago, June, 1925.

[2] Buswell, Guy Thomas, and Judd, Charles Hubbard, "Summary of Educational Investigations Relating to Arithmetic," *Supplementary Educational Monographs*, No. 27. Chicago: The University of Chicago, June, 1925.

[3] Lyman, Rollo L., "Summary of Investigations Relating to Grammar, Language, and Composition," *Supplementary Educational Monographs*, No. 36. Chicago: The University of Chicago, October, 1929.

[4] Curtis, Francis D., *Investigations in the Teaching of Science*. Philadelphia: P. Blakiston's Son & Co., 1926. *Second Digest of Investigations in the Teaching of Science*. Philadelphia: P. Blakiston's Son & Co., 1931.

[5] Turney, Austin H., "The Status of Ability Grouping," *Educational Administration and Supervision*, XVII (January and February, 1931), 21-42, 110-127.

Research Association, the *Review of Educational Research*, is devoted exclusively to presenting summaries and evaluations of research in each major field of education. Articles of the inventory type, as well as summaries of investigations, should be encouraged. They enable the supervisors to make greater use of research findings. They save labor and give the supervisor time for thought. Even summaries and inventories, however, will not do away with the necessity of critical thinking.

As has already been mentioned, results of studies of educational method are sometimes contradictory, and this may discourage and confuse some supervisors. In some instances such contradictions are due to imperfect reporting. Let us suppose that one investigator reports that phonics aids slow pupils in learning to read, while another investigator finds that phonics does not help slow pupils in reading. Frequently, when analytical thinking is applied to such contradictory findings, the conflict can be resolved. What kind of phonics did each investigator use? Was it the same in both studies? The answers to these questions may be gained from an inspection of the authors' reports on the methods used. The answers may show that each investigator used a different type of phonics, and therefore the studies really show that one type of phonics helped and the other type of phonics did not. An examination of the method used in each of these studies may show that the technique of one investigation was faulty. The phonics group in the study that favored phonics may have used a reading method which was somewhat different from that used by the non-phonics group with which it was compared. Since the reading method was not controlled, the favorable results shown by the study may have been due to the greater interest in reading and not to the effectiveness of phonics. Therefore, this study must be discarded as a measure of the value of phonics, since there were two factors either of which may have been responsible for the favorable results.

As the quality of the studies reported improves—and it has been steadily improving—contradictions due to poor reporting and to faulty method will tend to decrease in number. A practice which may aid in eliminating much of the faulty and poor

research is the tendency of investigators to confirm their findings by repeating their studies, or for individuals, other than the original investigators, to repeat important studies. Selke[6] repeated the study of reading vocabularies made by Selke and Selke.[7] Such repetition of studies would do much to develop greater confidence in educational research. Educators would do well to imitate medical research in this respect: to encourage more individuals to devote longer periods of time to their studies and to test their findings by repeating their experiments.

The wisdom of opening a chapter on the use of scientific method in curriculum studies with a discussion of the difficulties of using curriculum studies may be questionable. However much one believes in the value of a thoroughgoing knowledge of the results of curriculum studies, still one cannot but be sympathetic with supervisors who encounter the obstacles mentioned. They are obstacles to be overcome and not reasons for disregarding the help which can be gained. Much time and energy can be saved as well as discouragement and failure avoided by building on the work of others. Those who fear that the use of scientific method may lead to a coldly factual procedure have little ground for their fears, since there will always be plenty of room for creative thinking. Probably it is more humane to acquaint teachers with the work which others have done toward solving problems of the classroom than it is to permit them to stumble blindly through pitfalls which others have charted.

The Direction of Curriculum Studies

The majority of studies to be found in educational research have not been conducted by the supervisory group. Not many supervisors have as yet shown any particular skill in directing studies that may be termed truly scientific. The obstacles which act as deterrents to the use of results of curriculum studies have also dampened supervisors' interest in conducting systematic studies of their problems. However, there are probably addi-

[6] Selke, Erich, "A Comparative Study of the Vocabularies of Twelve Beginning Books in Reading," *Journal of Educational Research*, XXII (December, 1930), 369-374.

[7] Selke, Erich, and Selke, George A., "A Study of the Vocabularies of Beginning Books in Twelve Reading Methods," *Elementary School Journal*, XXII (June, 1922), 745-749.

tional factors which account for the absence of scientific procedure in dealing with supervisory problems. Among these are a lack of skill in organizing a controlled experiment, an insufficient knowledge of statistical methods, and a lack of appreciation of the value of such studies. The lack of time and the expense involved are sometimes cited as reasons for the absence of supervisory-conducted curriculum studies, but they do not seem to be valid reasons when one considers the amount of time and material which is now spent in fruitless search for the solution of classroom problems. The training in research and in statistical methods now offered in our colleges of education will aid in developing appreciation of the value of scientific method in study of classroom problems as well as the necessary skills. There is much, however, which the supervisor can do in self-training. Becoming familiar with the studies of others is a very good approach to the task of conducting one's own studies.

The limits of this chapter forbid a comprehensive discussion of the actual methods of conducting scientific investigations, even were such a discussion desirable. Many published treatises on how to do research in education are available which will acquaint the supervisor with the techniques. Chapter I presented a brief treatment of scientific procedure and referred to several helpful discussions of the subject. This chapter is confined to an overview of some of the principal types of curriculum studies. If this overview gives some insight into the scope of curriculum studies as well as a notion of their intimate relationship to the problems of the supervisor, then the purpose of the chapter will be accomplished.

In presenting the overview, four types of curriculum studies are used. These four types are overlapping and there are some important curriculum studies which could be classified readily under any of the headings. The types are sufficiently broad, however, to give a survey of the field. The curriculum studies most intimately related to the supervisors' work are those concerned with:

1. Determining the objectives or goals toward which school learning can and should be directed.

2. Determining the best method for directing the learning process toward the desired goals.
3. Determining the best content and the best activities through which the desired and presumably valid objectives may be most effectively and economically achieved.
4. Determining the age, grade level, or stage of learning at which desired objectives may be most economically and effectively achieved.

Determining Objectives

If the school is to meet its obligations of "bringing children to a progressive understanding of their responsibility for social progress and of the problems, practices, and institutions of social life,"[8] those who are entrusted with the direction of schools must have an understanding of the needs of society and of the obligation of the school to aid society to meet those needs. If the purposes of the school are understood even in part, and if the particular learnings which the school should and could promote are envisaged by the supervisors, teachers, and to a certain extent by the pupils, then much aimless wandering will be eliminated.

Probably the most useful as well as the major portion of all curriculum studies have been directed toward securing information concerning the aims of education. These studies have been quite largely the work of university instructors in education and of graduate students in education and not of supervisors. Studies designed to determine the objectives of education are usually so time consuming and of such long duration as to be impractical in the usual supervisory situation; therefore, the supervisor is largely a consumer of the work of others. He should be familiar, however, with sources of objectives and with the advantages and disadvantages of the methods commonly used.[9]

Some of the most commonly used sources of objectives are: analyses of adult life; analyses of child behavior; the agreement of experts; analyses of statistical records; analyses of textbooks and courses of study; and the analyses of the writings and pro-

[8] *The Foundations of Curriculum-Making,* Twenty-Sixth Yearbook, National Society for the Study of Education, Part II, p. 15. Bloomington, Ill.: Public School Publishing Company, 1926.

[9] Barr, A. S., *An Introduction to the Scientific Study of Classroom Supervision.* New York: D. Appleton and Company, 1931.

nouncements of careful forecasters of our social and economic life.

A brief description of the methods which have been employed in using each of these sources may serve to clarify the relation of this type of curriculum study to the business of directing teaching.

1. Analyses of adult life. Bobbitt's[10] presentation of the central theory of this method is undoubtedly familiar to the readers of the yearbook, and therefore it will need but little amplification. Human life consists of the performance of specific although varied activities. The investigator can discover these activities by going into the world of affairs and noting the particulars of which these affairs consist. The activities so discovered form the objectives of the curriculum.

Analyses of adult life have been used in a variety of ways and in a number of different fields. Bowden[11] used this technique to determine the social utility of school practices in teaching arithmetic. By means of a questionnaire, he secured from adults the kinds of arithmetic problems which they solve outside of their vocations. Data secured from the questionnaires were compared with school practice. Charters[12] reports a variation of this method to obtain exact descriptions of the activities performed by different types of occupational workers.

The use of analyses of adult life as a source of objectives is based on at least two important assumptions. First, of course, is the assumption that education is preparation for adult life. The controversy over the rôle which adult life and child life should play in determining the objectives of education is an old one. The validity of either of these sources, adult life or child life, depends not so much on the philosophy of the individual educator as it does on the nature of the school activity for which objectives are being discovered and on the school or age level at which the objectives are to be used. Many students of education

[10] Bobbitt, Franklin, *The Curriculum*, p. 42. New York: Houghton Mifflin Company, 1918.

[11] Bowden, A. O., *Consumers Use of Arithmetic*. Teachers College Contributions to Education, No. 340. New York: Teachers College, Columbia University, 1929.

[12] Charters, W. W., *Curriculum Construction*, p. 273-307. New York: The Macmillan Company, 1923.

believe that the objectives of the elementary school should be greatly influenced by child interests and child activities, but that those of the secondary school should be closely related to adult needs. The second assumption is that the activities now performed by adults are desirable. The method used should provide for the elimination of undesirable activities and such elimination may involve considerable error.

2. *Analyses of child behavior.* Since child interests and needs are, at least in theory, commonly accepted determinants of what should be taught in the schools, it is not strange that many of the more recent studies of objectives have utilized this source. There are studies of children's interests, such as Washburne's[13] analysis of questions pertaining to natural phenomena which were most frequently asked by children. Jennings[14] had pupils keep a diary on their out-of-school reading as a way of discovering their reading interests. Barnes[15] investigated the natural ways in which children use oral English.

Child behavior is studied also through analyses of children's errors and difficulties. Many language studies are of this type. Charters'[16] study of the language errors made by children in Kansas City is well known. Matravers[17] secured stenographic reports of high school pupils' out-of-school conversations and analyzed them to determine the social utility of different language forms.

3. *The agreement of experts.* This source implies the necessity of setting a valid technic for selecting experts and for securing a sufficient number of experts to give reliable data. Leonard[18] used this source to particularly good advantage in a study of grammatical usage and punctuation in English. His technic for selecting experts is fully described in his study. The committee

[13] Washburne, C. W., "Behavior of the Individual Child," *Modern Education,* II (April, 1930), 2-6.

[14] Jennings, Joe, "Leisure Reading of Junior High School Boys and Girls," *Peabody Journal of Education,* VI (May, 1920), 333-347.

[15] Barnes, Walter, "Language as Behavior," *Elementary English Review,* VII (December, 1930), 241-245; VIII (January and February, 1931), 14-17, 44-46.

[16] Charters, W. W., *op. cit.*

[17] Matravers, C. H., "Corrective-Language Program," *English Journal,* XVIII (September, 1929), 564-570.

[18] Leonard, Sterling A., *Current English Usage,* English Monograph No. 1. Chicago: National Council of Teachers of English, 1932.

on investigation in the modern foreign languages used this source for determining the immediate and ultimate objectives of modern foreign languages. Cole[19] describes their procedure.

4. The statistical records of schools and other social and economic institutions. The use of this source has been limited, probably owing to the somewhat restricted nature of definite records in many fields of instruction. It has been used particularly in discovering the goals of safety and health education. Analysis of reported accidents to children of school age forms the basis for much of the safety instruction.[20] Cairns[21] isolated certain health objectives by studying morbidity and mortality statistics and health records of pupils.

5. The analyses of textbooks and courses of study. This is a commonly used source, but it is based on an assumption which should not be lost from sight, namely, that what is used in textbooks and in courses of study is what should be used. The fact that a certain item is found frequently and persistently in texts and in courses of study does not necessarily prove that it is of value. If this assumption is kept in the foreground, undoubtedly objectives most frequently observed in textbooks form a basis for analytical thinking about desirable objectives.

Textbooks have been used to discover the basis and technical vocabularies, as well as topics or problems, of various subjects. Barr and Gifford[22] studied eight different high school texts in history and isolated a list of nineteen hundred words which occurred in seventy-five per cent of the books. Civics books were analyzed by Stephenson[23] and the vocabulary selected was tested to determine pupils' familiarity with it. Harap and Persing[24] had courses of study and textbooks in general science evaluated

[19] Cole, Robert D., *Modern Foreign Languages and Their Teaching.* New York: D. Appleton and Company, 1931.

[20] *Safety and Health Education.* Course of Study, Kindergarten through Grade VI. Minneapolis: Public Schools, 1932-1933.

[21] Cairns, Laura, "Scientific Basis for Health Instruction in Public Schools," *Publications in Education,* Vol. 2, No. 5, p. 95. Berkeley: University of California, 1929.

[22] Barr, A. S., and Gifford, C. W., "Vocabulary of American History," *Journal of Educational Research,* XX (September, 1929), 103-121.

[23] Stephenson, Orlando W., "The Special Vocabulary of Civics," *Journal of Educational Research,* XVIII (November, 1928), 297-304.

[24] Harap, Henry, and Persing, Ellis C., "Present Objectives in General Science," *Science Education,* XIV (March, 1930), 477-497.

by leaders in that field and then analyzed these materials to determine the objectives.

6. The writings and pronouncements of careful forecasters of our social and economic life. One of the principal studies of this source was that conducted by Billings.[25] He analyzed the writings of "frontier thinkers" in the social sciences and selected the basic generalizations and central themes which occurred. An analysis of social issues as found in treatises by authorities in the various technical social fields was included in Lee's[26] study.

Forecasters of social and economic life have for some time predicted that the increase in machine production would bring more leisure time. Alert directors of educational programs have taken cognizance of this prediction by providing school activities to aid in developing leisure time interests of a desirable type. These programs are, for the most part, rather haphazard because there are not as yet adequate studies either of what constitutes desirable leisure time employment or of the effectiveness of the programs which are being attempted. This phase of the educational program will undoubtedly receive more attention in the future.

As a consumer of objectives, the supervisor is confronted with the necessity of selecting from the studies available the objectives for his school, division of the school, or subject in which he is particularly interested. In the performance of this activity, the use of scientific method is quite as desirable as it is in the actual execution of an original study. The most common method used is that of compiling a list of objectives from the available studies and then submitting this list to teachers for evaluation.[27] Barr[28] suggests a more exact method of classifying and of correlating classifications. Harap[29] proposes certain criteria for determining the importance, interest, and difficulty of objectives.

[25] Billings, Neal, *Determination of Generalizations Basic to the Social Studies Curriculum*, p. 289. Baltimore: Warwick and York, 1929.

[26] Lee, Baldwin, "Issues in the Social Studies," p. 183. *Lincoln School, Social Science Monograph*, No. 3. New York: Teachers College, Columbia University, 1928.

[27] Broome, E. C., and others, "The Nation at Work on the Public School Curriculum," *Fourth Yearbook, Department of Superintendence*, N. E. A., Washington, D. C., 1926, p. 346-357.

[28] Barr, A. S., *An Introduction to the Scientific Study of Classroom Supervision*. New York: D. Appleton & Company, 1931.

[29] Harap, Henry, *The Technique of Curriculum Making*, p. 315. New York: The Macmillan Company, 1928.

The supervisor who finds it desirable or advisable to secure information on objectives, because of the incompleteness or the obsoleteness of published data, has a number of important decisions to make relative to his study, as: the best source of information; the best method of collecting data; and the best method of compiling and treating the data. After the decisions relative to these matters have been made and the steps have been successfully accomplished, follows the most critical phase of the investigation, namely, the interpretation of the results. The data will not yield ready-made objectives. Objectives can be derived only by critical interpretation and penetrating insight.

Determining the Best Methods for Directing Learning

Some studies purport to determine the general nature of certain learning activities; others attempt to determine the desirability of specific teaching methods.

Studies of the general nature of learning activities include studies of the transfer of training, such as that of Gates and Taylor's[30] investigation of whether beginners, in this case preschool children, learn to write script more effectively by first tracing letters on thin paper or by beginning at once with a free-hand copying method. The results revealed that the tracing group learned to trace letters but that this ability did not transfer to any marked extent to the formation of letters free-hand. Other studies shed some light on the value of pupil interest in learning situations and on many other phases of learning.

Studies of the desirability of specific teaching methods are numerous. They include studies of methods of teaching reading, literature, spelling, and other subjects. Excellent summaries of these studies are to be found in publications on the psychology of school subjects, such as those by Brooks[31] and Reed,[32] and in the publications of the American Educational Research Association.[33]

[30] Gates, Arthur I., and Taylor, Grace A., "The Acquisition of Motor Control in Writing by Pre-School Children," *Teachers College Record*, XXIV (November, 1923), 459-468.

[31] Brooks, Fowler D., *Applied Psychology of Reading, with Exercises and Directions for Improving Silent and Oral Reading*. New York: D. Appleton and Company, 1926.

[32] Reed, Homer B., *Psychology of Elementary School Subjects*. Boston: Ginn and Company, 1927.

[33] *Review of Educational Research*, I (January, October, and December, 1931).

Despite the volume of studies related to various phases of how to teach, the findings are more meager, fragmentary, and contradictory than are the results of studies of objectives. With the possible exceptions of reading and spelling, there is no subject on the teaching of which any considerable light has been shed. This situation is not due to any lack of interest in discovering better methods of teaching, but rather to the magnitude of the field and to the difficulties which attend investigations of learning. Individuals in supervisory positions have made relatively few contributions to our knowledge of the best ways of directing learning, although they are daily engaged in helping teachers to secure better educational results. Furthermore, supervisors occupy a particularly strategic position for directing curriculum studies of the general nature of learning and of specific methods of teaching. They have at hand classrooms which will serve as laboratories and they have also groups of teachers who are quite universally engaged in seeking out better ways of teaching. Supervision may become both creative and scientific by directing teacher interest into channels that will lead to satisfaction for the teachers. Greater use of controlled experiments and of careful case studies will enable teachers to gauge more accurately the success of their efforts and will also enable them to pass on their findings in usable form to other teachers. If the supervisor is to aid his teachers in organizing controlled experiments and in keeping careful case studies, it is necessary that he be thoroughly acquainted with the techniques involved. McCall[34] describes the use of group method experimenting and Crawford[35] discusses case study techniques. A general discussion of these procedures will be found also in Chapter I.

An illustration of a supervisory method involving the use of experimental method may serve to clarify the natural relationship that exists between curriculum studies of methods of teaching and the solution of supervisory problems.

A group of elementary school principals had, at the cost of

[34] McCall, William A., *How to Experiment in Education,* Chapter II. New York: The Macmillan Company, 1923.

[35] Crawford, Claude C., *The Technique of Research,* Chapter VI. Los Angeles: University of Southern California, 1928.

considerable labor, developed practice exercises for the correction of errors in grammatical usage. The group proposed that the material be printed for the use of pupils in grades four, five, and six. Quite naturally questions arose as to the effectiveness of the particular type of exercise which they had developed. Educational literature revealed no information on the point and therefore an experiment was outlined which would test the effectiveness of several types of drill exercises in correcting errors in grammatical usage. After the descriptions of six methods had been developed, the problem and a proposed plan of experimental teaching were laid before a group of elementary school principals for their suggestions, and they in turn presented the plans to their teachers for suggestions. The teachers of each building selected the method which they wished to try. The matter of participation in the experiment was entirely voluntary on the part of both principals and teachers. The following is a brief description of the method as reported in an unpublished manuscript.[38]

The problem and method of this study. The problem of this particular study was to compare six methods as to their effectiveness in securing correct usage in grades four, five, and six. The six methods were:

1. Games.
2. Practice on the incorrect form with knowledge of the correct form.
3. Proof reading of prepared paragraphs.
4. Choice of constructions with the filling in of blanks.
5. All methods, one week on each.
6. Choice of construction with the filling in of blanks plus the oral reading of all sentences.

In addition to these six method groups, a control group was used.

The general plan of the study included the following features:

1. A group intelligence test was given to all groups, and the groups were equated.
2. Pre-tests of pupil's ability to use twenty selected usages: there were two tests, one written test patterned after Charters' diagnostic test and a second oral test patterned after Webster's oral tests. The reliability of both tests was established.
3. Teachers' guide sheets were prepared describing completely the method for each group. The number of practice periods and the number of minutes of practice were carefully controlled.

[38] On file in the Department of Curriculum, Public Schools, Minneapolis, Minn.

4. Pupil practice materials were prepared for each method with the exception of the games where it was only necessary to supply the teachers with descriptions of the games to be used.
5. At the end of a six-week period, the initial tests were repeated to measure growth immediately after teaching.
6. The same tests were repeated two weeks after the close of the experimental period as a measure of retention.

The results of the study will not be reported in detail here. Briefly, method 6, "Choice of construction with the filling in of blanks, plus the oral reading of all sentences," was superior to all other methods. This method used the material developed by the principals, namely, practice exercises which required a choice of constructions to be used in filling in blanks. Added to the filling in of blanks was oral reading of all sentences. This suggestion as to the value of supplementing written drill with oral drill was of such interest to the group that one elementary school principal is now undertaking a second study under the direction of a university faculty member to test the reliability of this finding.

Such studies of method are not only interesting and satisfying to a group confronted with a teaching difficulty, but they also save considerable waste in teacher time, effort, and in the cost of materials. This method of meeting important supervisory problems is quite as creative and as democratic as is the more haphazard experimenting which is frequently identified by these two "catchwords."

Determining the Content and Activities of the Curriculum

Objectives and activities are interwoven—studies of objectives indicate the activities and studies of activities suggest the objectives. The arithmetic problems solved by adults outside their vocations aid in determining the content of arithmetic courses; the words which children tend to spell in natural activities and the words used in the writing of adults form a basis for selecting the subject matter of spelling; language errors of children and the language uses of adults influence the content and activities of English composition; children's interests in literature influence the content of the courses of study in literature; the questions

which children ask regarding natural phenomena modify the content of courses in general science; the natural play activities of children form a basis for physical education; reports of accidents to children of school age determine the course of safety instruction; the uses which both children and adults make of reading aid in selecting the reading skills to be developed in school.

An illustration is available of a supervisor-conducted study to determine desirable activities in junior high school art instruction. Prior to this study, the major objective of this particular junior high school art course was the development of skill in illustration, representation, and design. The social utility of these skills and of the activities which formed the content of the course was questioned. Some information as to how adults use art in their daily activities seemed desirable as a means of determining the social value of the course. Published curriculum studies offered no assistance in solving the problem; therefore, it was necessary to conduct a local study. A procedure was outlined for securing from approximately fifty citizens in each of three different occupational groups lists of the activities they had performed during the past year which involved a knowledge of art. A questionnaire was developed which stated the purpose of the request for information, defined what was meant by art, and asked the following five simple questions:

1. What tasks have you met in planning, decorating, or furnishing your home—the grounds and exterior as well as the interior?
2. What tasks have you met in selecting or designing clothing or personal effects?
3. What tasks have you met in planning community projects or in connection with clubs and organizations?
4. What activities have you engaged in during your leisure time, such as drawing, painting, or craft work for pleasure?
5. In what other activities have you taken part which involved knowledge of or skill in art?

The study is still in progress but the results as tentatively tabulated indicate a wide range of activities associated with the selection and arrangement of furniture and the selection of household accessories, such as pictures and lamps, as well as landscaping

activities of a varied nature. The results are of no particular moment for the purposes of this chapter. The interest and coöperation of teachers of junior high school art made the study easy to conduct and the results will aid undoubtedly in bringing art instruction in the city in which the study was conducted into harmony with social needs.

Techniques for studying child interests and for collecting information regarding adult activities are relatively simple. Supervisors can both enrich and improve present-day courses by comparing the activities suggested by those courses with studies of child interest and with studies of adult needs.

Determining the Age, Grade, or Stage of Learning at Which Desired Objectives May Be Most Economically and Effectively Achieved

Investigations of the placement of materials are limited in number. Present practice in matters of grade placement seems to be the basis for most studies of this problem. These studies of present practice have used questionnaires to school officials and analyses of textbooks and courses of study to determine the placement of items. Obviously, placement determined on such a basis assumes that present practice is desirable. This assumption is open to serious question. At least one study[37] suggests that our present practice in the placement of skills in arithmetic is sadly askew when the difficulty which pupils encounter in mastering these skills is taken into consideration in determining placement.

In addition to the use of present practice and difficulty of items as a basis for grade placement, child interest has been used to a limited extent. Only a few studies have used a combination of factors, such as child interest, difficulty in learning, and teacher judgment.[38] There is need for more studies of the combination type. Considerable waste in education undoubtedly occurs on

[37] Washburne, Carleton W., "The Grade Placement of Arithmetic Topics: A 'Committee of Seven' Investigation," *Twenty-Ninth Yearbook, National Society for the Study of Education*, p. 641-670. Bloomington, Ill.: Public School Publishing Company, 1930.

[38] Uhl, W. L., "Scientific Determination of the Content of the Elementary School Course in Reading," *Studies in the Social Sciences and History*, No. 4. Madison, Wis.: University of Wisconsin, 1921.

account of the placement of items on levels where learning is too difficult or where the items fail to challenge interest.

The problem of grade placement has not, as yet, received the attention which it merits. The common method in practical school practice is the use of teacher opinion. Lists of desirable learnings are submitted to teachers for placement on the basis of pupil interest and difficulty. While such a method is undoubtedly superior to the judgment of one individual, still the results of such studies show such wide variation in the judgments made that the need of a more exact method of determining placement is evident. Here again the supervisor through his daily contact with the classroom can aid in directing studies of placement. To be sure, it may require considerable courage to break with tradition, which has long required the teaching of long division in the fourth grade and fractions in the fifth, but there is sufficient evidence in the difficulties of individual pupils as well as in some group studies that, while objectives and activities may be well selected, still they are improperly placed.

CHAPTER VIII

HOW TO USE THE SCIENTIFIC METHOD IN THE PREPARATION AND INSTALLATION OF COURSES OF STUDY

BEFORE YOU READ THE CHAPTER. Did you ever stop to think how many different courses of study are in use in this country as compared with the number of different textbooks? A single text may be used in hundreds and thousands of school districts; a single course of study, except for state courses in some states, is rarely in effect in any district other than the one for which it is prepared. Courses of study are essentially local in nature; they draw from the universal reservoir of curriculum knowledge, but they present a selection of objectives, content, and methods to be followed in particular school systems; they are prepared locally to serve local purposes. This chapter is designed to afford assistance to the supervisor in building and using courses of study in as scientific a manner as possible.

The steps in the scientific method used in the preparation and installation of courses of study and bulletins on method are the same as those outlined in Chapter I. Furthermore, the steps used will be the same in all types of school organization regardless of the size of the system in which the organization is functioning. The methods by which these steps may be put into operation and the procedure used in carrying out the details will no doubt vary from one community to another. Educators will agree, however, that the same end is to be served, namely, to help the classroom teacher to do better her work of guiding the pupils in her room to grow more effectively toward the goals set up by the school system and by the community.

RELATION BETWEEN CURRICULUM STUDIES AND COURSES OF STUDY

In Chapter VII the various procedures used in selecting the content of the curriculum and the methods of instruction were outlined. This chapter will show how the scientific method may

be used in preparing, organizing, and putting into operation for the teacher's use the materials and the methods which have been selected on the basis of curriculum studies. Such an arrangement of the work to be done in the school is called a course of study.

Usually a course contains a statement of the basic principles of education accepted for the school, the suggested activities for the classroom, and the suggested methods by which the activities may be carried on. Thus when the supervisor writes a course of study he is the consumer of the studies made by himself, or others, when working as a curriculum investigator. Because of the close relation between curriculum studies and the preparation of courses of study, some overlapping in the two chapters is bound to occur. It is hoped, however, that the overlapping which does appear is one of reënforcement rather than of mere duplication.

From one point of view, nothing is more useless than a printed course of study. It signifies a state of completeness, or the realization of a desired product. From another point of view it is a milestone in the process of curriculum revision, which serves as a guide toward the accomplishment of a goal. It helps to crystallize the progress which has been made and to clear the way for the next step in experimentation and the realization of the goals of teaching.

> All courses of study tend to become formalized. In this rapidly changing age any course may be out of date almost as soon as the print is dry. To be of real value, a course of study must undergo constant change and revision in the light of actual classroom experiment. Every teacher should feel free to suggest modifications and changes in this course of study as a result of her practical experience with it.[1]

Illustration of Procedure Used in Building a Course of Study

How can the scientific method be used in preparing a course of study or bulletin on method? Perhaps the best answer to this question is to present an outline of the procedure used by one

[1] Spain, Charles L., *Course of Study in Reading*, Introduction, p. 10. Detroit: Board of Education, 1931.

supervisor in her attempt to use the scientific method in preparing a course of study. This outline is given here not because it illustrates the only way to use the scientific method in building a course of study but because it does indicate one approach. Furthermore, this outline is in accord with the general plan presented in the chapter.

PROCEDURE IN THE CONSTRUCTION OF A COURSE OF STUDY IN THE ACTIVITY PROGRAM IN HEALTH EDUCATION FOR JUNIOR HIGH SCHOOL GRADES[2]

I. Factors in the Detroit situation:
   A. Principles of education.
   B. Principles of health education.
   C. The junior high school in the whole school program.
      There are 22 junior high schools in Detroit with an enrollment of approximately 35,000, representing varying socio-economic status, intelligence, racial background.
      Fundamental to the organization of the junior high school are the following principles:
      1. Exploration and orientation in all subjects.
      2. Little or no retardation or acceleration.
      3. Unit of organization, the homeroom with 45 pupils.
      4. Grouping into ability levels by means of age, general intelligence, past achievement, teacher recommendation.
      5. Educational and vocational counseling.
      6. Choice of curriculum: language, commercial, or practical arts.
      7. Last opportunity for reaching all children because of compulsory education law.
   D. Health education time allotment and facilities.
      1. Five 60-minute periods a week.
      2. Facilities: gymnasiums, swimming pools, playground, orthopedic rooms, health instruction rooms.
      3. Type of work: natural program in individual and group sports, intramural and inter-school athletics, dancing, stunts, swimming, orthopedics, health instruction.
      4. One hundred and fifteen men and women teachers, on the whole well educated and well qualified to promote a child-centered program.

II. Principles governing organization of the course of study:
   A. Boys' and girls' programs constructed together. Men and women teachers have coöperated throughout, an unusual procedure in the field of physical education.
   B. Progression through activities and not by grade.
   C. Content organized around the physical education plant:

[2] Collins, Laurentine B., First Assistant, Health Education Department, Detroit, Michigan.

1. Gymnasium program
   a. Dancing
   b. Free play
   c. Squad play
   d. Mass games
2. Swimming program
   a. Swimming
   b. Diving
   c. Life saving
3. Playground program
   a. Sports—soccer, speedball, golf, basketball, tennis, etc.
   b. Skills
   c. Intramural program
   d. Inter-school program
4. Orthopedic program
5. Health instruction
6. Tests and measurements
   a. Homogeneous grouping
   b. Orientation
   c. Accomplishment
7. Administration

III. Organization of committees:
For the most part all teachers selected for work that division of content in which they were most interested.

A. Articulation Committee (advisory)
Supervising Director of Intermediate (Junior High) Schools
Supervising Director of Instruction
Director of Health Education
First Assistant of Health Education
Assistant Director of Curriculum Research
2 Principals
2 Assistant Principals

B. Central Committee (administrative)
Department heads of health education in all 22 schools
Women in charge of girls' programs

C. Correlating Committee (technical)
Chairmen of committees on content

D. Sub-committees on content
Every teacher in the junior high schools helped.

IV. Provision of general information to all committees:

A. Presentation of first outline in detail to all groups.

B. Questionnaire on organization and administration.
Tabulated results of present practice presented to teachers as a check list served as a partial basis on which to build the new course of study.

C. Survey of outstanding courses of study in this and allied fields.

V. Procedure of each committee:
   A. Survey of literature in field. Bibliographies were worked out for each large division.
   B. Discussion of educational philosophy for:
      1. Understanding of modern education.
      2. Understanding of needs of intermediate school.
      3. Understanding of health education objectives.
   C. Outline of general objectives in each body of content.
   D. Outline of specific objectives in each body of content.
   E. Assembling of material.
   F. Organization of material according to a coöperatively selected unit technique.

VI. Revision of all material in accordance with a coöperatively selected unit:
   A. General objectives of the unit.
   B. Specific objectives of the unit.
   C. Activities.
   D. Suggested teaching procedures.
   E. Outcomes.
   F. Tests.
   G. References.

VII. Completion of course of study:
   A. Writing the introduction.
      Succinct statements on the following are to be prepared in order to present the point of view on progressive education as it applies to the Health Education program in the Detroit public schools:
      1. Socio-economic factors
      2. Racial factors
      3. Basic needs of the intermediate school child
         a. Biological
         b. Psychological
         c. Emotional
         d. Mental
   B. Writing a statement on organization and administration.
      Faced with unusually large classes, it is imperative that the teacher organize his program carefully and wisely. This chapter will follow closely the main headings stated in the questionnaire on present practice in the junior high schools.
   C. Selecting sample lessons.
      Inclusion of actual lessons illustrative of various teaching procedures on various levels based upon stenographic reports and descriptions.
   D. Preparing an annotated bibliography.

VIII. Printing, multigraphing, or mimeographing of course of study in 1933-1934.

IX. Installation of the course of study.

Responsibility for Preparing a Course of Study

A survey[3] of common practice in preparing courses of study reveals the fact that a larger number of persons participate in the work in each school system today than participated a decade or more ago. The procedures used may be classified under three types. In one type the supervisor does all the work; in another type a committee is appointed with a chairman guiding the work of the other members; and in the third type the entire staff of the school system is utilized in the preparation of a course of study. All three have some advantages as well as some disadvantages. Regardless of the type of general administrative plan set up for building courses of study, the responsibility for directing the work falls on one individual. That individual is usually the supervisor, or at least one who acts in a supervisory capacity. Throughout the remainder of this chapter, then, the supervisor will be considered as the one responsible for the course of study.

A course of study prepared by one who does not use the scientific method is often illogical, incoherent, and does not meet the needs either of the community or of the pupils for whom it is intended. It is usually based on opinion, prejudice, and very little scientific evidence. Too often such a course is made by the so-called "scissors and paste" method.

A supervisor who uses the scientific method in the preparation of a course of study finds that his work naturally falls into several divisions. Since these divisions are similar to those ordinarily outlined by specialists[4] in the field, they will be used as the outline of the chapter. The divisions are as follows:

1. Selection and definition of the problem.
2. Study of the objectives of the school system and of the division of the school system for which the course of study is intended.
3. Selection of activities to attain objectives.
4. Decision as to the form which the course of study is to take.
5. Writing of the course and the suggested activities.

[3] Lide, Edwin S., *Procedures in Curriculum Making.* U. S. Department of Interior, Office of Education Bulletin, 1932, No. 17, Monograph No. 18.

[4] Cocking, Walter D., *Administrative Procedures in Curriculum Making.* New York: Teachers College, Columbia University, 1928.

6. Tentative try-out of course of study activities in the classroom.
7. Revision of the course in the light of the experimentation.
8. Final editing of the course for the printer.
9. Installation of the course for general use.
10. Evaluation of the course and appraisal of outcomes.

Selection and Definition of the Problem

Usually the supervisor or the person in charge of a particular subject or division of the school system has been studying the situation in the field to become familiar with the conditions prevailing. Such study results in the identification of the problem. It may be that teachers are not all working toward the same goal in the field of the subject. It may be that the present course of study has outlived its usefulness and thus a demand exists for a revised course; or perhaps a survey has shown that the procedure, or method, or textbooks in use do not produce the desired results. Whatever the condition, the situation requires attention.

Collection of available facts. The method which the supervisor uses in becoming acquainted with the situation may or may not be scientific. Scientific method requires that all the available facts of the total situation be analyzed. The supervisor's decision should be based not on the opinion of a few individuals only but rather on the composite judgment of all teachers interested. Likewise, if objective evidence is used, it must be representative of the whole situation, not merely of a few cases.

Selection of committee. Let us assume that the supervisor wishes to make a careful analysis of the problem and that he desires to make use of a committee in the study of the situation and in the preparation of a course of study. How can he use the scientific method in the selection of the committee? He could appoint a few of his friends or a few of the people who have had the greatest amount of experience. He could appoint a few individuals who are political leaders among the teachers, or he could use any number of similar methods. Obviously, these methods of choosing a committee do not meet the criteria of the scientific method. Therefore, he should consider the characteristics of the people needed for such a task. Various points of

view from different parts of the organization or city, the contributions which different people have made or can make, all need to be considered. In other words, standards of qualification for committee members should be set up and persons should be selected who can meet these qualifications.

Collection of opinions of teachers. After the committee has been selected and appointed, the members' first task is to familiarize themselves with the situation. It will be necessary to review all the evidence which the supervisor has gathered, and to collect any other evidence that may seem to be required. For example, to become acquainted with the opinion of the teachers concerned, one such committee formulated a questionnaire that was sent to all the teachers of social science in the Detroit secondary schools. On the basis of the results secured from this questionnaire, revisions were made in the organization of the social science program. Bulletins describing modification in methods of teaching as revealed by the answers received were also prepared. Thus the committee was able to make use of the opinions of a large number of teachers and to modify the program accordingly.

SOCIAL SCIENCE QUESTIONNAIRE[5]

The Department of Instruction and the Social Science Division are interested in getting a definite reaction from each of the social science teachers in Detroit to certain problems and trends in the social science field.

It is believed that every teacher of social science in the intermediate and high school units will be interested and will profit professionally by answering this questionnaire. We believe that you will be impressed with the value and significance of such a study to yourself and the curriculum of the school system.

PART I

The trends in the field of social science may be classified, according to the sponsors of each plan, into four groups. These four trends are reviewed briefly below. Each is designated by a letter, A, B, C, or D. Read these four synopses[6] of the trends in order to answer the questions in Part I following the descriptions.

A. One group holds that the primary purpose of all education is the complete natural development of an individual. The members of this

[5] Dondineau, Arthur, "Trends of Social Science Teaching in Detroit." *Junior-Senior High School Clearing House*, V (September, 1930), 45-52.

[6] Only Trends A and D are given here.

group think of the child as a sovereign individual and hence they do not make any plans wholly for future citizenship but believe that an individual who is able to solve the problem he meets today will thereby have equipped himself to solve those he shall meet tomorrow. In other words, the purpose of the school is to help the pupil do better those things which he will do anyway. They would not teach the separate subjects in social science or any other subject as such but would have the pupil attack the problems or activities which he sees in the community about him. To solve these problems the pupils would draw upon geography, history, civics, sociology, economics, and social psychology. Hence in the solving of these problems the subjects lose their identity as separate subjects. The teacher will guide the pupils in their discussions and direct them to the best sources to answer the questions which arise concerning their problems. Thus the problems in each school, and even in each class, will vary with the type of community and the type of individuals taking the course.

. . .

D. A fourth group holds that the purpose of education is to develop in a pupil a cultural and carefully trained mind. Members of this group believe that those school subjects are best which provide for a maximum of mental training. Further they believe that the mind is trained best through the classification and organization of the world of knowledge, and that the learning of factual material such as events, places, and laws relating to general cause and effect develops the mind so that it is able to learn more easily and to retain better those things in life which are related to the subject taught. In the field of social science they believe that geography, history, civics, economics, and sociology should be taught as separate subjects and that the emphases in these subjects should be placed upon the memorization and organization of knowledge.

1. Which of the foregoing trends in social science is most nearly in harmony with your philosophy of education? Write *A*, *B*, *C*, or *D* here ————————.

2. Which of the foregoing plans are you able to approach in your teaching? ————————.

3. If all the instructional material necessary were available under present working conditions, which of the foregoing plans would you favor? ————————.

4. In your opinion, which of the foregoing plans was probably most common in Detroit twenty years ago? ————————.

5. In your opinion, which of the foregoing plans should Detroit move toward in the next five or ten years? ————————.

Part II[7]

1. Should controversial questions be discussed in social science classes? Answer *Yes* or *No*. ————————.

[7] Space prohibits the inclusion of all the questions asked in Part II.

2. In the general high school course, other than that intended to prepare for college, which of the following types of procedures for social science classes would you favor for class use? Write *A, B, C, D, E, F,* or *G* here ————————.

[In the questionnaire were given brief descriptions of the seven types of procedures.]

3. Should lessons be planned specifically to develop desirable attitudes, or will the desirable attitudes be developed adequately by presentation of subject matter? Give your answer here. ————————.

4. In the elementary school in Detroit are we justified in replacing geography by social science? Answer *Yes* or *No.* ————————.

5. In the elementary school should geography as such be taught (a) as a fund of information to be drawn upon later by the other social studies, or (b) as a part of social science for a better understanding of present day problems? Answer here. ————————.

6. Can desirable social attitudes be accomplished best through homogeneous intelligence groups, or heterogeneous intelligence groups? Answer here. ————————.

Adoption of the Objectives for the School System

The second problem of the supervisor in the building of the course of study is to have those working with him come to some agreement on the objectives of the school system, the school, the grade, and the pupils of the age for which the work is intended. Such an agreement can be reached best if the committee proceeds in an objective manner. Harap[8] presents the following five procedures to show how the scientific method may be used to select objectives:

1. Direct analysis of the natural activities of children.
2. Direct analysis of the social needs of the learner.
3. Secondary analysis of the needs of the learner.
4. Analysis of the needs of the learner in the opinion of competent persons.
5. Analysis of existing objectives as found in, or inferred from, curriculum studies, courses of study, and textbooks.

In the case of each objective, Harap[9] suggests that the following questions need to be answered:

[8] Harap, Henry, *The Technique of Curriculum Making,* p. 38. New York: The Macmillan Company, 1929.
[9] Harap, Henry, *op. cit.,* p. 118.

1. Is this objective adequately attained outside of school?
2. How important is this objective? (The measure of importance is indicated on a scale from 0 to 10. The least important objectives are eliminated.)
3. How interesting is this objective to the pupil? (The measure of interest is indicated on a scale from 0 to 10. The objectives which appeal least to the interest of the pupils are eliminated.)
4. Is the achievement of this objective within the capacity of the pupil?

"Finally," Harap[10] says, "designate the appropriate grade into which each objective falls and the appropriate subject or subjects within a particular grade into which each objective falls."

Selection of the Activities to Attain the Objectives

The third problem in the building of the course of study is to select the activities by which the objectives will be realized. These may be called teaching units, classroom experiences, or pupil activities. At this time the supervisor, if his work is to be scientific, will concern himself with a survey of the pupils' interests and abilities, much of which can be found in the literature available on the topics. A study will assist the supervisor in his recommendation of activities for particular grade levels and different types of pupils within a grade level. To be scientific in the selection of these activities the supervisor will choose those that have been found effective in teacher growth in his own school system, in other school systems, or in the laboratory schools. On the basis of such a selection he will try out the activities with different types of pupils and in schools with different types of environmental conditions. In addition, he will gather the opinions of the teachers, the principals, the parents, and the pupils themselves. In the light of the findings from such appraisals, the activities may be eliminated, revised, or adjusted to the age-grade level and capacity of the pupils within a particular grade.

The difficulty which confronts the supervisor in allocating the different activities to the desirable age-grade groups is somewhat baffling. For this reason an illustration of how the scientific method was used to select activities which are best suited to the pupils of particular grade levels follows:

[10] Harap, Henry, *op. cit.*, p. 119.

Illustration from the field of health education.[11] The complete study which was made to determine the likes and dislikes of boys and girls in health education activities is too long to be quoted in full. However, a few excerpts from the report of the study will show the procedure used.

Instructions to Teachers: In order to determine the indoor health education activities which are most satisfying to boys in Grades V, VI, VII, and VIII, the enclosed questionnaire has been prepared to be used in surveying approximately ten thousand children within these grades.

Below is a list of activities in which we take part in the gymnasium. Some of these activities you like to do better than you like to do others. Check the five which you like to do best in the gymnasium and print the letter *B* on the line in front of these activities.

..... quoits
..... rope skipping
..... shuttle relay
..... set up
..... rope climbing
..... rhythms
..... other relays
..... soccer dribble

The complete list included twenty-eight activities. The results were tabulated and the rank order of ten of them is given in the accompanying table. Basketball goal shooting had the highest rank of the twenty-eight activities. High jump was second; playing catch, third; and stunts, fourth. The remainder of the table is read in the same way.

RANK ORDER RATING OF ACTIVITIES IN HEALTH EDUCATION BY PUPILS IN GRADES V–VIII

	1	2	3	4	5	6	7	8	9	10
GRADE	BASKET-BALL GOAL SHOOT-ING	HIGH JUMP	PLAY-ING CATCH	STUNTS	DASH	SOCCER DRIB-BLE	FIST BALL	HUR-DLING	NINE COURT BASKET-BALL	HAND BALL
V	3	1	2	4	5	7	12	8	19	9
VI	1	2	3	4	5	6	9	7	12	12
VII	1	2	3	8	10	6	5	10	4	11
VIII	1	2	3	12	11	13	5	18	4	9

It will be noted that stunts, although rated fourth in the total number of activities, was not so ranked by pupils in all grades. It was fourth in the fifth and sixth grades, eighth in the seventh grade, and twelfth in the eighth grade. Thus it will be seen that after the sixth grade there is a rapid decline in the preference of pupils for stunts.

[11] Blanchard, Vaughn S., "An Analysis of the Likes and Dislikes of Boys and Girls in Health Education Activities," *Research Quarterly of the American Physical Education Association,* IV (March, 1933), 238-245.

A similar condition is shown for nine court basketball. It had the rank of nineteenth place in the fifth grade, twelfth place in the sixth grade, and fourth place in the seventh and eighth grades. Thus it would appear that nine court basketball is best suited to pupils above the sixth grade.

One of the most difficult tasks of the supervisor in selecting activities to attain the objectives is that of interweaving the various activities provided so as to give pupils practice in the use of the required tools in situations where those tools are most needed. In this task the supervisor will need to be familiar with the curriculum studies related to the problem and should make use of all those studies that are pertinent. An illustration from the field of spelling will help to show how such work can be undertaken.

Illustration from the field of spelling. In preparing a spelling course of study[12] for the Detroit schools, the committee which had been assigned the task discovered, after considerable study, many activities normally engaged in by pupils in the classroom in which spelling was used. Thus, spelling is needed in writing letters, writing plays, writing reports for social science, preparing outlines for art, music, and health. It was discovered also that pupils in the various grades enjoyed working in these fields through different devices, such as working crossword puzzles, filling in blanks, and copying sentences. By making use of these devices in the various activities in which spelling is used, pupils are able to practice spelling in real situations.

The activities are organized into exercises for the spelling lessons, four exercises constituting a group or a lesson for one day a week. The four exercises of each group are graded and all of them are arranged according to a scheme which provides for a repeated rotation of difficulty. The reading vocabulary, the length and construction of sentences, and the demands on spelling ability have also been considered in the construction of these exercises. Thus the writer of this course of study made use of the curriculum studies reported in educational literature. An example[13] of one group of four exercises for Grade 3A follows:

[12] *Spelling Bulletin for Elementary Schools.* Detroit: Board of Education, 1932.
[13] *Experiences in Spelling,* Grade 3A, p. 26-27. Detroit: Board of Education, 1933.

A. Nine and Ten

Write the spelling words in Groups 9 and 10 in alphabetical order.

B. A Story

Choose any picture in the room. Write three or four good sentences about it. Use your spelling dictionary.

C. In School and Out

Put all the words that belong to vacation time in one list. Put the words that belong to school time in another list.

fun on the island	such a good lesson
science class	leave the city
trip	while you write your spelling
map of Detroit	

D. Missing Words

Copy the sentences. Write the missing words.

1. Easter eggs come from ..... (rabbits, chickens)
2. Oranges grow on ..... (trees, bushes)
3. Cream and milk ..... (come from chickens, come from cows, are made in a factory)
4. Butter is made from ..... (flour, cream, eggs)

A list of the activities suggested for pupils' use in spelling follows:

Activities

1. Filling in blanks
2. Composition (expression)
   a. Free
   b. Guided
   c. Verse form
3. Problem solving
   a. Riddles
   b. Concepts
4. Word study
   a. Dictionary
   b. Recognition of letters
   c. Homonyms
   d. Spelling rules
   e. Composing definitions
   f. Writing lists
   g. Origin of our alphabet
   h. Development of our language
   i. Rewriting paragraphs and substituting more apt words or more simple words

j. Word meanings
k. Word analysis
l. Associations

5. Games

A list of the fields of experience around which spelling exercises were built for the various grades follows:

FIELDS OF EXPERIENCE AROUND WHICH SPELLING EXERCISES WERE BUILT

A. Exact Science
1. Number
a. Concepts
b. Processes
2. Time sense
a. Immediate
b. Remote

B. Fine Arts
3. Drawing—Painting
4. Music

C. Health Education
5. Safety
a. Self
b. Others
6. Well-being
a. Physical
b. Mental
c. Emotional

D. Language Arts
7. Dictionary
a. Use—Habit
b. Word study, lingual debts, language developments, dialects
8. Communication
9. Expression
10. Usage
a. Mechanics

E. Social Science
11. Geographical facts
12. Geographical interpretations
a. Effect of climate on crops, significance of moraines, gorges, deltas, etc.
b. Effect of environment on customs, clothes, occupations; political significance of coastlines, rivers, etc.; economic significance of geography, e.g., seaport as a centralization of population
13. Transportation
a. Comfort, speed, mechanics, inventors

b. Political, economic, social significance of railroad, automobile, steamship, airplane, vs. foot travel, animal power
14. Community to individual
a. City services to individual
b. State services
c. United States services
15. Individual to community
a. Attitude toward law enforcement, coöperation in preservation of private and public property, franchise duties, tax duties
b. Coöperative living in Detroit
16. International problems
a. Economic relations
b. Political relations
c. Cultural relations
d. Ethnic relations

F. Vocational
17. Consumer
a. Rights
b. Duties
c. Qualifications
d. Significance in economic scheme
18. Producer
a. Rights
b. Obligations
c. Qualifications
d. Significance in economic scheme

Decision as to Form Which the Course of Study Will Take

The fourth step in the building of the course of study is to select the form of organization that will make the course most usable. In the organization of the course two different aspects should be considered: one aspect pertains to the organization of the whole course and the other to the organization of each unit of work in the course.

But which of the several possible organizations of the whole course is to be adopted? Only by the use of the scientific method can the organization best suited to the needs of the teachers be determined. The general outline should be organized in different ways and tried out by teachers in the classroom to see which form is best suited to meet the needs. The recommendations from the teachers should then be consolidated to determine the consensus of opinion.

In like manner a unit of work should be organized in several different ways and should be tried out by the teachers to see which unit organization is most usable. The several types of organization for the unit should be rated by some scale, probably in the form of a rank order rating. These too should be consolidated to find the consensus of opinion. On the basis of the evidence thus collected, the final organization for the whole course and for the unit within the course will be chosen.

Illustration of general outlines. The following illustrations show forms of organization used in certain cities:

NAME OF CITY Ann Arbor, Michigan DATE RECEIVED November/1930
NAME OF COURSE Social Studies[14] YEAR PRINTED 1929
GRADES INVOLVED Kindergarten, 1 and 2 NO. PAGES 92
FORM (multigraphed, mimeographed, printed) Multigraphed
CONSTRUCTED BY: Primary Supervisor, assisted by principals and teachers (four years' work)
GENERAL PLAN:
- Dedication
- Foreword and Acknowledgment
- Introduction (Educational Creed)
- Table of Contents
  - Introduction: Unifying-socializing projects
  - Meeting needs of young children
  - Educational values (appreciation, etc.)
  - Progression through grades
  - Suggestions on method
  - Appendix (3)
    - Bibliography
    - Assemblies
    - Habit scale

SUBJECT MATTER DIVISION:
Under "Method" is discussed:
1. How to plan for a project
2. How to prepare a room for project work
3. How to launch a project
4. How to carry on a project
5. Time allotment
6. How to evaluate experience
7. How to select projects
8. Descriptions of projects

[14] *Social Studies in the Public Schools.* Kindergarten, 1, and 2. Ann Arbor, Michigan: Board of Education, 1929.

TEXTS RECOMMENDED:
None. The bibliography appended is in three divisions:
1. Informational material
2. Illustrative material
3. Related literature
Each division in two sections:
1. Children
2. Teacher

NAME OF CITY Los Angeles, California DATE RECEIVED January 1/1931

NAME OF COURSE Fifth & Sixth Grade Course of Study[15] YEAR PRINTED 1931

GRADES INVOLVED 5 and 6 NO. PAGES 335

FORM (multigraphed, mimeographed, printed) Printed

CONSTRUCTED BY: Director, Course of Study, working with Central Course of Study Committee (6 principals, 2 counsellors, 6 teachers, 3 course of study department), supervisors, 72 additional principals and teachers.

GENERAL PLAN:
Foreword (Superintendent)
Discussion of an Activity Program
Table of Contents
1. Activities (Z group), 35 types
2. Reading and literature
3. Social studies
4. Nature study
5. Agriculture
6. English expression
7. Penmanship
8. Music
9. Art
10. Arithmetic
11. Physical education
12. Orchestra
13. Speech correction
14. Books for browsing table

SUBJECT MATTER DIVISIONS:
Reading and literature (typical of each division)
1. Suggestions
   a. List of activities
   b. Improvement of reading abilities
   c. Illustrative lessons; skill; enjoyment
   d. General information
2. Outcomes
3. Books—for children; for teachers

[15] *Teachers' Guide—Intermediate Unit.* Los Angeles, California: Board of Education, 1931.

TEXTS RECOMMENDED:
A number of books both for pupils and teachers are listed, following each subject matter division in addition to the state adopted text.

NAME OF CITY Detroit, Michigan DATE RECEIVED 1930

NAME OF COURSE Course of Study in Health Education[16]

YEAR PRINTED 1930

GRADES INVOLVED 7, 8, and 9 NO. PAGES 124

FORM (multigraphed, mimeographed, printed) Printed

CONSTRUCTED BY: Director of Health Education; First Assistant, Health Education; Assistant Director of Social Sciences; Director of School Health Service, Board of Health; Director, Curriculum Research; Principal, Cleveland Intermediate School; Director, Exact Sciences; Director, Vocational Education; and fifteen teachers and department heads.

GENERAL PLAN:

Introduction
Committees

Part I

General Objectives of Education
General Objectives of Health Education
Contribution of Special Health Services
Medical service
Nursing service
Health integrator
Other agencies
Organization
Statement of Principles

Part II[17]

7B—Integrating Idea: How the health of each individual may be maintained at the highest efficiency through proper and intelligent care.

7A—Integrating Idea: How the structure and organic functions of the body contribute to the maintenance of health.

8B—Integrating Idea: How the human race acquires, utilizes, and disposes of the food materials necessary to life.

8A—Integrating Idea: The mutual responsibilities of the individual and society in the protection and care of human life.

9B—Integrating Idea: How the health program of the community is promoted and maintained so that it may contribute in the largest way to the happiness and usefulness of each individual and to the best development of the race.

9A—Integrating Idea: The significance of the mental, emotional,

[16] *Course of Study in Health Instruction for Intermediate School Grades.* Detroit Public Schools. Detroit: Board of Education, 1930.

[17] In order to conserve space the job units for each grade are not given here.

and social ability of the individual to meet his environment and to make the necessary adjustments to it.

Part III
Bibliography
Foot infections
Reasons for which a child should be referred to the nurse or principal.

Actual Writing of Course and Suggested Activities

The fifth step is the writing of the course of study and the activities that are to be included. This may take the form of general exposition or description of suggested units. In either case each unit should follow the same general plan, a procedure which enables teachers to follow the work from unit to unit. There seems to be no general agreement on either the main headings of the units or the subheads within a unit.[18] Some have used headings such as: unit of work, jobs, activity, and project. Within a particular unit of work some have used subheads such as: method, materials, references, and standards of attainment; others have used objectives, procedures, subject matter, references, and standards; still others, objectives, class activities, visual material, and references. The organization of the unit will depend somewhat on the nature of the course and the grade for which it is intended. In any case, actual try-out of the course by teachers will indicate which organization is best suited to meet the needs of the teachers using the course.

Try-out of Activities in the Classroom

The sixth step in the building of a course of study is the try-out of the course itself in the classroom. It should be tried in two or more schools, the number depending somewhat on the size of the school system, but a fair sampling of the entire system should be provided. In this way, a method of careful checking and a procedure for evaluating the results of the experiment should be set up. The evaluation should be made of all parts of the course and not merely of the course as a whole. Thus each unit of work should be checked and evaluated separately. Finally, a complete report of the results, together with the judg-

[18] Strateмeyer, Florence B., and Bruner, Herbert B., *Rating Elementary School Courses of Study*. New York: Teachers College, Columbia University, 1926.

ment of the teachers and the principals in the schools where they have been used, should be prepared. In the light of the experiences gained, changes can be made in the course.

In order to make a unit of work of greatest value for teaching purposes, it should be complete enough so that teachers and principals see how this unit can fit in with other units. It must be possible for the teacher to understand the philosophy back of the building of the unit and this should be so obvious that it is not necessary for him to read too much between the lines or to guess at what is intended. The teachers' comments should show whether the unit is appropriate for the pupils in his room and for the kind of community in which he is working, whether the content is interesting or uninteresting, whether it provides for action either mental or physical, and whether it stimulates pupils to do further work. If an illustration is given which contains reading material for pupils, it should be written so that the pupils can read it with understanding; that is, the vocabulary, sentence structure, and ideas should be appropriate for the pupils for whom it is intended.

Finally, each unit should be checked to see that it provides for individual differences within a particular class. If it does, it will meet the following standards:[19]

1. The same basic social experiences should be provided for all pupils.
2. At certain times these experiences can be provided by organizing the pupils into special groups, and at other times, especially in certain subjects, it may be necessary to provide for individual progress.
3. Whether the activities are organized for the group or for the individual, several levels within the unit of a particular experience should be provided in order that a pupil may work according to his ability, aptitude, and interest.
4. The groups should be organized so that it is possible for a pupil to be working in a different group in each of the present school subjects without material loss in school progress. Furthermore, the groups for each subject should be flexible so that it is possible for each individual to move freely from one group to another in accordance with his needs.
5. The basic experiences should be supplied by life activities for the different groups which will appeal to the mental level of the individuals.

[19] Irwin, Manley E., "Caring for Individual Differences," *Los Angeles Educational Research Bulletin*, X (February-March, 1931), 1.

These statements imply that all pupils should not be required to attain the same degree of mastery, but all should have the opportunity of the cultural values of these experiences and that all should have the opportunity to use these experiences in interpreting life about them.

Thus, each individual will be stimulated to put forth his greatest effort. At the same time, because some degree of success will be possible for all, no individual will become discouraged.

Revision in the Light of Experimentation

After the material has been carefully tried out, the seventh step in the building of the course of study calls for revision. The revision will take into account the criticisms which have come from principals, teachers, pupils, and parents. Care should be exercised in the use made of criticisms. In no case should suggestions be incorporated merely because they have been made. The degree to which the suggestions will alter the course of study will depend on several factors, namely, frequency, pertinence, potency, justification, and the like. Each criticism should be subjected to a check list such as the following:

1. Was the criticism made frequently?
2. Was the criticism such that it would alter the entire point of view expressed in the course of study?
3. Did the criticism show that the person making it had a real understanding of all the interrelated problems?
4. Does each criticism suggest an alternative?
5. Is there evidence to show that the criticisms were justified?

Final Editing of the Course for the Printer

Editing the manuscript may be called the eighth step in the process of preparing a course of study. The work is usually assigned to one or two persons. Such an assignment will tend to remove inconsistencies and evidences of a patchwork process. Again no definite rules can be laid down for the best procedure to follow in all courses or in all situations. However, the editor should adhere to some authoritative manual of style.

Too great emphasis cannot be placed upon the care with which the editing of a course is done. Often a very careful piece of work loses much of its force when edited by some one who has had no experience in such work. Courses of study frequently lack that care and attention given by reputable publishers to a

manuscript. If the work is carelessly done, teachers will not have the same respect for it that they would have had for a more carefully edited piece of work. The attractiveness of the general form, the paragraph arrangement in a page, the illustrations used, and even the cover design should not be overlooked. The person who does the editing performs a task which will help greatly in deciding the success or failure of a piece of work no matter how excellent its content may be.

Installation of the Course of Study

The ninth step is the installation of the course of study. Little agreement is found among the practices in different school systems regarding the responsibility of installation. In many cities this responsibility is given to the principal, who is the head of both instruction and administration in his school. In these cities the responsibility of the supervisor ceases after the course has been printed. In some cities the supervisor himself is responsible for the installation, while in other cities the teachers who wrote the course carry the additional responsibility of seeing that it is properly installed. In a few school systems, the course of study is sent to the schools to be used as the principals and teachers see fit. Wherever the responsibility is placed, the use of the scientific method in this work calls for careful planning.

As in all steps of preparing a course of study, the problem of installation calls for a clear definition of each step to be taken. If the procedures suggested in this chapter have been followed, many principals and teachers will be well acquainted with the new course both from their contacts with the preparation of the original materials and from their participation in the experimental work. Some of them will have served on committees which have prepared all or parts of the course of study. Thus there will be a nucleus of teachers in the field who are already familiar with the whole course. The other school principals will need to familiarize themselves with the underlying philosophy, the aim of the subject, the content, the organization, and the suggested methods. Meetings should be held at which the supervisor explains the new course. Such meetings should be

followed by demonstration lessons at which both teachers and principals may study the course in practical situations.

Hopkins[20] lists a total of twenty-three steps necessary in the task of installing a course of study. He includes not only those steps which are generally considered a part of the problem of installation but also those which, in this chapter, are considered a part of the evaluation and appraisal of the course. In any compiled list the various steps may be classified under four headings: explanations, interpretations, demonstrations, and observations.

1. Explanations regarding the philosophy, objectives, content, and methods of the course should be made to principals, teachers, pupils, parents, and other members of the community.
2. Interpretations of any portion of the course or the relation of the whole course to other courses in the curriculum should be made to the principals, teachers, pupils, parents, and other members of the community.
3. Demonstration lessons should be provided by the supervisor, showing the principals and teachers the methods of instruction suggested for typical units.
4. Opportunities for observation of the work of both teacher and pupils in carrying out the activities suggested should be provided for principals, teachers, and others.

Evaluation of the Course and Appraisal of Outcomes

The tenth step is an evaluation of the course of study through an appraisal of its effects. Such an appraisal should show the changes made in pupils in their growth toward the desired goals. Not only should measurement of the changes made in pupils be obtained but also the problems confronted in the classroom as a result of the new course should be collected. To obtain such evaluation and appraisal of the course of study, the supervisor will:

1. Collect evidence on pupil growth as shown by the cumulative school records.
2. Collect from the records in the community evidence showing the changes made in the boys and girls.
3. Prepare and conduct a testing program to discover the relative achievement of pupils under the new and the old course of study.

[20] Hopkins, L. Thomas, *Curriculum Principles and Practices.* New York: Benjamin H. Sanborn and Company, 1929.

4. Prepare and give uniform curriculum tests for each unit based on the objectives of the course of study.
5. Analyze the results of the tests to discover the learning difficulties of pupils.
6. Analyze the results of the appraisal program to discover defects in the course of study, such as wrong grade placement, poorly selected content, improper methods, or undesirable outcomes.
7. Analyze the results of the appraisal program to discover comparative success of pupils in different schools and of different types of pupils within a school.
8. Prepare report blanks for teachers to fill out at stated periods recording their reactions to the new course.
9. Prepare report blanks for pupils to give their reactions to the new course.
10. Discuss the course of study with parents to obtain their reactions to the new course.

In the light of the findings from the different reports the supervisor should make the necessary modifications. These modifications may be sent out in the form of bulletins, among which will be the following:

1. Special bulletins showing such changes as should be made immediately in the course of study.
2. General bulletins showing changes which need to be made in the course of study during the second year of its use.
3. Bulletins showing the results of the findings made from the reports of teachers and pupils.

The ten steps suggested in this chapter as being desirable in the process of building and installing a course of study parallel more or less the steps in the scientific method as outlined in Chapter I. Not only can science be applied to every step in the process, but the scientific method can also be used in the whole task of building a course of study. And as is suggested in the scientific method, the accomplishment of the first goal makes possible the accomplishment of larger goals. With the installation of the new course of study the cycle is complete and the process of building a new course starts again. The task is never finished—new problems arise and in the light of fresh evidence, more experience, and further experimentation, refinements can be made.

CHAPTER IX

HOW TO USE THE SCIENTIFIC METHOD IN THE SELECTION AND PREPARATION OF INSTRUCTIONAL MATERIALS

BEFORE YOU READ THE CHAPTER. Some one has said that, regardless of courses of study and the activities of supervisors, the instruction in the classroom depends very largely upon the textbooks in use. "The book" is still a major, if not the chief, source of learning in most schools. To the degree that this is true, it is evident that the textbooks and other instructional materials should be selected wisely, and the locally developed supplements should be prepared in the best possible manner. This chapter is an effort to suggest to supervisors how the selection of commercial materials and the construction of local instructional aids may be conducted in accord with the principles of scientific procedure, and thus insure the optimum growth of pupils.

In past times the pupil with a book, a slate, a pencil, and a sponge was considered well equipped for school. Today all this is changed. The modern pupil is often literally surrounded with aids to his learning: textbooks, supplementary readers and libraries; notebooks, workbooks, practice sheets, and tests; pictures, maps, lantern slides; and so on in seemingly endless profusion. Merely to hint at the contrast is to emphasize how important it is that scientific techniques be applied in all the steps involved in planning for and in providing adequate instructional materials for the modern school.

This change has not come about in haphazard fashion—it is essentially the product of two movements which now complicate the supervisor's task of providing instructional materials of proven worth for the school. The first movement springs from the tendency toward an enriched and diversified curriculum which has existed in America for many years. In spite of the lack of formal centralization in American schools, the enrichment of the curriculum has proceeded along lines which, taking

the country as a whole, are broadly uniform. This uniformity of development, together with the very magnitude of the movement for universal education in America, has presented both a task and an opportunity which commercial concerns have not been slow to meet. The natural result has been that, when the responsible agents of any school system, large or small, face the necessity of providing for appropriate instructional materials, they find themselves confronted with the problem of making a selection from a great variety of offerings. Surely if personal whim or bias is to be removed from the process of selection, scientific procedures must be perfected to meet the problem.

The second movement, complementary to that which has produced the need for scientific selection of commercially prepared teaching aids, springs from the urge to vitalize instruction through increasing its adjustment both to the local background of pupil-experience and to the differences in aptitude found among learners. Obvious difficulties stand in the way of commercial preparation of materials to meet this need. If such materials are to be used, they must apparently be produced locally. The result has been that supervisors frequently face the necessity either for preparing, or for guiding the preparation of, instructional aids to supplement the commercial materials used in the schools. In this work, too, there is need for the application of scientific method.

Thus school supervisors face a double task in planning for materials which will facilitate instruction. On the one hand, there is the necessity for evolving more and more truly scientific procedures for the *selection* of commercially prepared instructional aids. On the other hand, there is the need to devise equally scientific procedures for the *production* and *refinement* of local instructional materials. The present chapter deals with different aspects of the two-way problem.

Instructional materials defined. As here used, the term "instructional materials" means those tangible, visual, auditory, and motor aids to learning which are actually used by the pupils. Interpreted broadly, such aids include texts, supplementary books of all sorts, charts, guide sheets, contracts, workbooks, practice

books, seat-work helps, informal and standardized tests, inventory records, visual materials and the like. The purpose of instructional materials in general is to supplement through increased adjustment or through enrichment such learning experiences as the teacher can supply. The content of the present chapter, however, is limited to the consideration of materials which are printed or written, leaving for discussion elsewhere and for individual investigation the application of scientific method in the selection and preparation of other types of instructional materials.[1]

Selecting Commercially Prepared Materials

The general problem of selecting commercially prepared instructional materials resolves itself into two subsidiary problems:

1. The question of the agent or agents to whom shall be given the responsibility for making the selection.
2. The question of the procedure to be followed in securing the appraisal which is basic to selection.

It would seem that the application of scientific method to the general problem would involve (a) arraying as many solutions as possible for each subsidiary question; then (b) evaluating each possible solution in terms of both its general merit and its feasibility in the situation; and finally (c) choosing the organization of agents and the program of appraisal whose combination has the highest general merit among the combinations of agent and program of appraisal which are at all feasible in the immediate situation.

Techniques of appraisal as they are commonly reported in the literature combine the agent and his activity. This is as it must be in the end. Thus appraisal may be carried on by a single individual relying on his general impressions of the instructional material being considered. Or, it may be conducted by a committee using listed criteria as a basis for judgment. Or, it may involve many persons in a program of carefully controlled experimentation to check the "working effectiveness" of the mate-

[1] The 1934 yearbook of the Department of Elementary School Principals will deal with the subject, "Aids to Teaching in the Elementary Schools," including maps, globes, exhibits, lantern slides, motion pictures, radio, etc.

rials. However, there is no necessary association in the above pattern: single individual—simple technique; many individuals —complex technique; it is always possible for a small group to use highly refined techniques, and for a large group to follow techniques of questionable validity. Consequently, for the purposes of the present discussion an attempt is made to sort out these two aspects of the problem of selection and to deal with them separately. This procedure, it is hoped, will leave the greatest degree of freedom in choosing the combination of agent and activity that is best for the local situation.

Organization for the selection of materials. In America the primary responsibility for the selection of instructional materials is customarily vested in the school board, whose members are the elected representatives of the people. Under modern forms of school administration, however, the responsibility for the active phases of the process of selection is delegated by the board to the superintendent of schools as its responsible professional agent. In the smaller localities this usually means that the superintendent himself is the person who carries through to completion whatever steps are taken for appraisal. Even in these situations it is well for the superintendent to consider whether there are possibilities for sharing the task with other professional agents. In the larger localities the superintendent frequently re-delegates a large part of the responsibility for the work either to individual supervisors, to standing committees of specialists within the school system, or to special committees of supervisors, principals, and teachers appointed for the express purpose of subjecting specific materials to thorough analysis and evaluation. In these situations the question of the agents to be used in making the selection is most complex, and the possible answers to the questions are numerous.

It is impossible to array here all possible types of organization by means of which professional agents may be mobilized for the selection of instructional materials. The scientific thing to do is for the superintendent or the supervisor who shoulders the major responsibility for the selection to canvass his own local situation thoroughly with a view to discovering all the possibili-

ties for organization among the available agents, and then to weigh one plan against another until the best one or ones have been recognized and the others arranged in the order of their general merit. Finally, of course, a judgment must be formed as to which are feasible in the local situation and most appropriate for carrying out the technique chosen for appraisal.

Techniques of Appraisal in Relation to the Selection of Commercial Materials

Techniques of appraisal which may be used in the selection of commercially prepared instructional materials range all the way from simple to complex and from gross, unvalidated judgment to refined scientific evaluation. Ideally there are two general types of procedures which ought to be employed. First, the materials themselves should be analyzed in relation to such factors as: the findings of research in the psychology of learning; standards set by best editorial practice and most skillful textbook construction; common practice in the preparation of similar materials; pupils' interests; and the stated objectives of the local course of study. These comparisons involve what may be thought of as the "statics" of appraisal. Second, there is the ever-present need to check the actual working effectiveness of the material in the classroom. Here the possible techniques vary from subjective estimate to objective experimentation of a high type. These may be thought of as the "dynamics" of appraisal.

Standards instituted by outside agencies. The first and most obvious type of appraisal is to check the given materials against the standards which are being set up as basic in the making of instructional aids. These standards are gradually being evolved by textbook makers, by the best of editorial practice, by psychologists, and by those who are especially interested in the physical needs of the child.

Some of the standards evolved by the textbook makers include the following:

1. The use of a basic vocabulary adapted to definite grade levels.
2. The use of a format which has been proved to give a minimum of eye strain.

3. Attempts to regulate the frequency of use of certain skills in order to insure enough repetition for learning.
4. The providing of answer sheets in order that materials may be self-corrective.
5. The organization of materials in ways to improve their handling and accessibility (through table of contents, index, bibliographies, etc.).

Guides to the selection of a *basic vocabulary* have been worked out in the field of history by Barr and Gifford,[2] Kelty,[3] and Pressey and Pressey.[4] Each of these investigations presents a minimal vocabulary in the field of history on varying grade levels. Such a minimal list of words has been worked out by Stephenson[5] in the field of civics. He lists 2000 or more words in order of frequency as occurring in ten civics textbooks.

In the field of arithmetic, studies of vocabulary have been made by Buswell and John,[6] and by Dale.[7]

Special vocabularies are now known for English and composition needs. Two comparatively recent studies are by Fitzgerald[8] and Hughes.[9]

No mention will be made here of the standard vocabularies already well known in the fields of reading, spelling, and writing. Much investigation is still being made of vocabulary needs, but there are at the present time sufficient aids to warrant vocabulary selection of a high order.

In the problems of *format*, investigations by Bamberger,[10]

[2] Barr, A. S., and Gifford, C. W., "The Vocabulary of American History," *Journal of Educational Research,* XX (September, 1929), 103-121.

[3] Kelty, M. G., "Suggested Basic-Vocabulary in American History for the Middle Grades," *Journal of Educational Research,* XXIV (December, 1931), 335-349.

[4] Pressey, L. C., and Pressey, S. L., "The Determination of a Minimal Vocabulary in American History," *Educational Method,* XII (January, 1933), 205-210.

[5] Stephenson, O. W., "The Special Vocabulary of Civics," *Journal of Educational Research,* XVIII (November, 1928), 297-304.

[6] Buswell, G. T., and John, L., *The Vocabulary of Arithmetic.* Supplementary Educational Monograph, No. 48. Chicago: University of Chicago Press, 1931.

[7] Dale, E. G., "The Business Vocabulary of the Sixth-Grade Pupil." *Ohio State University Educational Research Bulletin,* XI (May 11, 1932), 260-262.

[8] Fitzgerald, J. H., *The Vocabulary, Spelling Errors, and Situations of Fourth, Fifth, and Sixth Grade Children's Letters Written in Life Outside the School.* Ph.D. Dissertation, Ohio State University, 1931.

[9] Hughes, M., *Teaching a Standard English Vocabulary with Initial Reading Instruction.* Santa Fe, N. M.: New Mexico State Department of Education, 1932.

[10] Bamberger, Florence E., *The Effect of the Physical Make-up of a Book upon Children's Selection.* Baltimore, Md.: The Johns Hopkins Studies in Education, No. 4, 1922.

Buckingham,[11] Blackhurst,[12] Gates,[13] Gilliland,[14] and Paterson and Tinker[15] have provided many aids in the standardizing of materials. Standards of editorial practice vary among publishing houses, but for the general use of supervisors and teachers such guides as *The Manual of Style*[16] will furnish valuable suggestions.

Before attempting to select instructional materials which are designed to provide enough repetition to insure learning, one should read the critique of arithmetic materials by Greene,[17] in which he has defined and described the three types of drill materials needed, given some criteria for arithmetic drill materials, and summarized experimental data which are valuable as guides in the making of instructional materials in arithmetic.

Many other types of data are available and should be known by supervisors who are engaged in the selection of instructional materials. Some of these studies relate to the selection of textbooks. For instance, Dawson[18] has made a study of twenty-six primary readers to find what materials of a historical nature they contain. Another study which should be helpful in setting up criteria for the selection of basal texts in social studies was made by Lacey.[19] Pressey and Fischer[20] have set forth some standards

[11] Buckingham, B. R., "New Data on the Topography of Textbooks," *Thirtieth Yearbook*, National Society for the Study of Education, Part II. Bloomington, Ill.: Public School Publishing Company, 1931, p. 93-125. Cf. Buckingham, B. R., "Type Sizes of First Grade Textbooks Are Tested for Readability," *The Nation's Schools*, XII (September, 1933), 45-48.

[12] Blackhurst, J. H., "Hygienic Standards in Type and Format of Reading Materials." *Elementary English Review*, V (April, 1928), 101-103.

[13] Gates, A. I., "What Do We Know About Optimum Lengths of Lines in Reading?" *Journal of Educational Research*, XXIII (January, 1931), 1-7.

[14] Gilliland, A. R., "The Effect on Reading of Changes in the Size of Type," *Elementary School Journal*, XXIV (October, 1933), 138-146.

[15] Paterson, D. G., and Tinker, M. A., "Black Type Versus White Type," *Journal of Applied Psychology*, XV (June, 1931), 241-247.

[16] *The Manual of Style: Containing Typographical Rules Governing the Publications of the University of Chicago, together with Specimens of Type.* Chicago: University of Chicago Press, 1927.

[17] Greene, H. A., "A Critique of Remedial and Drill Materials in Arithmetic." *Journal of Educational Research*, XXI (April, 1930), 262-276.

[18] Dawson, M. A., "Materials of a Historical Nature Contained in Twenty-six Primary Readers," *Elementary School Journal*, XXIX (June, 1929), 756-766.

[19] Lacey, Joy M., *Social Studies Concepts of Children in the First Three Grades.* Teachers College Contributions to Education, No. 548. New York: Teachers College, Columbia University, 1932.

[20] Pressey, L. C., and Fischer, R., "The Geographical Background Necessary for the Study of History," *Ohio State University Educational Research Bulletin*, XI (April 27, 1932), 234-238.

necessary in geographical background preliminary to the study of history. Thralls[21] has contributed criteria for planning subject matter in geography.

In the field of reading, many aids are available. Briggs,[22] Cooper,[23] Mingo,[24] Bruner,[25] and Jensen[26] have made studies which may well be used as guides in the selection of reading materials. Dolch[27] presents some data in support of the view that vocabulary records based on samplings from a book are not representative of the book as a whole and may not be a reliable measure of the vocabulary load of a book. Patty and Painter[28] describe a technique developed in a research project at Indiana University in which all state-adopted high school textbooks written in the English language were measured. Through the use of their technique, the authors were able to determine which of forty-three high school texts had the greatest vocabulary burden.

Two studies are available as guides in the selection of workbooks. Goodrich[29] reports the results of a questionnaire study among 245 users of workbooks to determine the advantages and limitations of workbooks in teaching. Gates[30] made a study of items which a workbook should include: background information, supplementary materials and examples, diagnostic testing possibilities, "interest-stirring" notes and procedures, and easily followed plans for doing the desired work.

[21] Thralls, Zoe A., "Criteria for the Selection and Organization of Subject Matter in Geography," *Journal of Geography*, XXXI (November, 1932), 324-330.

[22] Briggs, E. D., "Selecting Readers and Primers for Use in Library Children's Rooms," *Library Journal*, LV (June 1, 1930), 502-503.

[23] Cooper, R., "Overlapping of Content in Elementary Readers," *Elementary School Journal*, XXXII (March, 1932), 542-545.

[24] Mingo, J., "List of Materials and Books Suitable for Use in Remedial Reading," *Teachers College Record*, XXXI (November, 1929), 137-147.

[25] Bruner, H. B., "Determining Basic Reading Materials Through a Study of Children's Interests and Adult Judgments," *Teachers College Record*, XXX (January, 1929), 285-309.

[26] Jensen, Frank A., *Current Procedure in Selecting Textbooks*. Philadelphia: J. B. Lippincott Company, 1931.

[27] Dolch, E. W., "Sampling of Reading Matter," *Journal of Educational Research*, XXII (October, 1930), 213-215.

[28] Patty, W. W., and Painter, W. I., "A Technique for Measuring the Vocabulary Burden of Textbooks," *Journal of Educational Research*, XXIV (September, 1931), 127-134.

[29] Goodrich, T. V., "Is the Workbook a Necessity or a Luxury?" *School Executives Magazine*, L (April, 1931), 359-361.

[30] Gates, A. I., "The Workbook in Practice," *School Executives Magazine*, LI (April, 1932), 349-378.

The list of data for use in the selection of instructional materials is too lengthy for complete enumeration. The sampling of data here presented will suffice to show the types of studies which should be known by supervisors and placed before teachers who are studying instructional materials.

Standards derived from common practice. Another technique which may be used in the appraisal of instructional materials is that in which several texts or materials of the same nature are compared to find their common points. An example of this type of analysis is shown in the study which Nudelman[31] made to find the kind of pupil exercises used in elementary history texts. From his survey of history texts he found that thirty kinds of exercises are generally recognized and he gives the frequency of use of each type. A different approach is illustrated by Leonard's monograph on *Current English Usage*,[32] which is based on a survey to determine what is acceptable English today. Another type of assistance which seems to make for adaptation to best practice and which is widely used by supervisors is that represented in the studies by Newlun,[33] Parker,[34] Dawson,[35] Smith,[36] and Dolch.[37]

In these studies various criteria have been evolved from the practices that appear to give a successful outcome. The criteria may then be used as a measuring stick in selecting instructional materials. Newlun has thus set up some questions basic to reading practice which may be used in selecting basal readers. Parker has set up standards for the selection of map equipment. Dawson, for the seventh and eighth grades, and Smith, for the elementary grades, have worked out elaborate standards for the

[31] Nudelman, E. A., "Pupil Exercises Used in Elementary History Textbooks," *Elementary School Journal*, XXIX (January, 1929), 351-357.

[32] Leonard, S. A., *Current English Usage*. English Monographs, No. 1. Chicago: The National Council of Teachers of English, 1932.

[33] Newlun, Chester, "Selection of Basal Readers," *Elementary School Journal*, XXXII (December, 1931), 285-293.

[34] Parker, Edith, "Selection of Map Equipment for Elementary Schools," *Elementary School Journal*, XXVIII (February, 1928), 429-435.

[35] Dawson, Mildred, "Language Textbooks," *Elementary English Review*, VI (February and March, 1929), 43-46, 69-73.

[36] Smith, Dora, "Report of the Committee on the Evaluation of Textbooks in Composition," *Elementary English Review*, X (June, 1933), 151-155.

[37] Dolch, E. W., "Exercises in Readers," *Elementary School Journal*, XXXIII (September, 1932), 59-66.

selection of English textbooks. Dolch has made a study to find the considerations that should apply in determining the kinds of exercises to be given in readers for the primary grades.

Standards based upon children's interests. If we define the expression "instructional materials" to mean tangible aids to learning which are actually to be used *by the pupil*, it would seem entirely logical and highly desirable that any materials considered for adoption be appraised in terms of pupils' interests. An example of standards based upon children's interests which may be used in the selection of books is the result of the study continued by Gates[88] from the previous research in children's interests conducted by Dunn. The "elements in children's reading material which contribute the most to interest," according to Gates, are as follows:

1. *Surprise;* unexpectedness; unforeseen events, happenings, conclusions, and outcomes.
2. *Liveliness;* action; movement; having "something doing."
3. *Animalness;* presentations of things animals do; of acts about them and their characteristics and experiences.
4. *Conversation;* talk.
5. *Humor;* from the child's point of view.
6. *Plot.*
7. *Suitability;* intelligible; within the range of child's experience.
8. *Freedom from difficulty;* resulting from adultness of content, from too great concentration (lack of repetition), from complicated sentence structure, abstract conceptions.

Gates further concludes that "interest is decreased, other things being equal, by *moralness* and by what some adults appraise as *humor*." He also says that "both studies [the Dunn and the Gates] agree that there is little or nothing in certain *forms* of writing that influences children's interests appreciably."

The analysis of materials in relation to the course of study. No analysis of instructional materials can be complete unless it is recognized that the materials finally selected must become an integral part of the working course of study. Consequently a supervisor should evaluate all materials in relation to the objec-

[88] Gates, Arthur I., *Interest and Ability in Reading*, p. 89-90. New York: The Macmillan Company, 1930. See also Dunn, Fannie W., *Interest Factors in Primary Reading Material*. Contributions to Education, No. 113. New York: Teachers College, Columbia University, 1921.

tives, the topics, and the units as set forth in the course of study for the pupils who are to use the materials. Each text or type of material will then be checked to see how many times and how well each objective, topic, or unit has been treated. The best materials would be those containing "the largest number of satisfactory treatments of the largest proportion of topics."[39] This type of analysis borders so closely upon types of investigation which are commonly styled "research" but in which analysis too frequently stops with a mere presentation of the results of enumeration that a word of caution may well be inserted. As Whipple puts it, "the quantitative treatment of data is not an end in itself; it is only a means of arriving at significant conclusions on the basis of the data."[40] After all, raw data are useless without adequate interpretation.

Ideally the tabulation which is employed in this type of analysis should be extended from the enumeration of the separate occurrences of significant elements to the enumeration of the occurrence of these elements in relation to each other. An example of this is to be found in a study by Kramer,[41] who made an analysis of four factors in verbal problems in arithmetic: interest, sentence form, style-details, and vocabulary.

Checking working effectiveness of materials. The ultimate test of the worth of any instructional material is its effectiveness in facilitating learning by the pupil in the classroom. Too frequently the evaluation of commercially prepared materials stops with techniques which here have been called the "statics" of appraisal. Although it is entirely appropriate that analysis should precede trial under working conditions, appraisal which is well-rounded will not stop there—it will include the "dynamics" as well.

The least acceptable technique for estimating the classroom worth of any materials is the uncontrolled judgment of an

[39] Waples, D., and Tyler, R. W., *Research Methods and Teachers' Problems*, p. 159. New York: The Macmillan Company, 1930.

[40] Whipple, G. M., "The Improvement of Educational Research," *School and Society*, XXVI (August 27, 1927), 249-259.

[41] Kramer, Grace A., *The Effect of Certain Factors in the Verbal Arithmetic Problem Upon Children's Success in the Solution*. Johns Hopkins University Studies in Education, No. 20. Baltimore: Johns Hopkins Press, 1933.

individual teacher or supervisor. But even this is better than no attempt at such a check. Further, the technique of using subjective judgment can be improved through providing criteria as a "standardizing" influence. Thus, if a teacher is using his own observation as a basis in forming conclusions in regard to the worth of certain instructional materials, he should be helped to see that the criteria, *adequacy* and *objectivity*[42] must be applied to his observation. Under the criterion of adequacy the teacher ought to ask himself: Am I making my observations often enough to be sure that no typical items are being missed? Am I observing a sufficient number of cases or taking enough samples? Under the criterion of objectivity he ought to ask himself: Am I using figures rather than wordy opinions to weigh values? Am I avoiding words that have only a subjective value? With practice, one can become skillful in observation on a fairly objective level. Controlled or "standardized" observation has led to some of our most important findings in methods and materials; it should not be undervalued as a technique to be used in supervisory investigations of instructional materials.

More acceptable techniques for checking the working effectiveness of instructional materials involve the experimental approach. Here the experimenter will need to use all the most refined techniques of research. Control and experimental groups should be formed after preliminary testing has been done as a basis for the matching of groups and the pupils within the groups. The teachers of these groups should also be matched as equally as possible. In nearly all such experiments it is better to select more than enough teachers and pupils at the outset, since difficulties may arise which will result in some loss of cases.

The main problem in carrying on carefully controlled experimentation with the public school as a laboratory is to be able to control the situation so that there will be only one variable factor in the experiment. One study which Buswell characterizes as "typical of the better experiments classified . . . as two-group experiments"[43] and which makes a conscious attempt to approxi-

[42] Waples and Tyler, *op. cit.*, p. 151-152.

[43] Buswell, G. T., "Psychology of Learning, General Methods of Teaching, and Supervision," *Review of Educational Research*, III (October, 1933), 319.

mate the conditions of a single variable is that in which Bergman and Vreeland[44] studied the mastery of vocabulary in the primary grades under two methods of teaching reading, namely, a visual method and a picture-story method.

> Recognizing the difficulties of setting up a single experiment to cover all of the objectives of the methods, the authors limited their investigations to one factor, namely, the development of vocabulary. The experimental set-up included subjects from three schools using the picture-story method and three similar schools using the visual method. The teachers for these experimental rooms were selected according to the principals' ratings for the preceding year. Special regulations were prepared for the classes participating, governing such matters as length of class period, outside practice in reading, preparation of supplementary instructional materials, etc. The experiment was carried on for a period of fifteen weeks, the results being measured by administering two forms of the Detroit Reading Test. . . . Since an analysis of the tests showed that one of them was somewhat biased in favor of the visual method, the authors came to the final conclusion that the picture-story method should be considered superior. They recognized, however, that the difference is not large and, furthermore, they gave clear recognition to the fact that their experiment had measured only one of the factors involved in the methods studied.[45]

Preparing Local Instructional Aids

The general problem of preparing local instructional aids, like that of selecting commercially prepared materials, resolves itself into a series of subsidiary problems. Three merit attention here:

1. The question of the agent or agents to whom shall be given the responsibility for preparing the materials.
2. The question of the standards of workmanship to be used in the actual production of the materials.
3. The question of the procedures to be followed in appraising the materials as a basis for their continued improvement.

As before, the application of scientific method to the general problem of preparing materials involves (a) arraying as many solutions as possible for each of the three subsidiary problems; (b) evaluating each possible solution in terms both of its general merit and its feasibility in the immediate situation; and then

[44] Bergman, W. G., and Vreeland, Wendell, "Comparative Achievement in Word Recognition under Two Methods of Teaching Beginning Reading," *Elementary School Journal*, XXXII (April, 1932), 605-616.

[45] Buswell, G. T., *op. cit.*, p. 318.

(c) choosing the combination of solutions which has the highest general merit among the solutions which are at all feasible.

Organizing for the preparation of materials. The making of instructional materials calls for creative ability of such an order that many supervisors feel that the task must be their own. In smaller localities this may be true. In larger localities, however, there is little excuse for any one individual shouldering the entire burden, if burden it be. There are too many teachers who can contribute creatively if they are only allowed to do so; there are too many possibilities for the utilization of experts, either from service departments within the system or from outside institutions; there is too much to be gained in terms of personal and professional growth through the coöperative endeavor of committee work upon such projects. Indeed, the advantages in combined effort are so great that no supervisor, however small his community, can afford to ignore the possibilities for organized work upon the preparation of local instructional aids.

Committee workers. To meet the needs of committee workers, various plans are devised. Sometimes models of instructional materials are prepared by the supervisor or by a central committee and distributed to the workers. Samples of directions may be prepared for pupil use. The teacher committees may in turn evaluate the directions in terms of levels of difficulty and may experiment with the directions on various groups of pupils in order to ascertain how the reactions of fast and slow workers indicate which of the directions are difficult or easy to follow. Usually committees of teachers work best when they are willing to experiment and revise materials according to the findings of the experimentation.

The objective of such committee work should be improvement in the technique of preparing materials as well as in the materials themselves. By recognizing both objectives each committee may serve as a means for training other groups of inexperienced teachers, who may be launched on further projects.

Experimenting teachers. Some very successful instructional materials have been made in systems where certain expert teachers are chosen to try out materials, keep records of the pupil

reactions, and revise the materials in the light of the findings. A brief description of one project[46] in the making of materials by experimenting teachers follows:

Teachers of the third and fourth grades were selected to work out a unit of nature study in connection with a trip to the zoo. Each teacher kept a diary of each day's work on the unit and each was given special books and aids for the project. Conferences were held with the nature study supervisor, but each teacher used her own initiative in determining what she would do each day. At the close of the project a composite was made of all the activities and materials that had grown out of the work of the six teachers. The result was then printed and made available to any other teachers who might care to take their pupils to the zoo and integrate the accompanying experiences into a unit. Some of the materials thus made available to the teachers were:

Suggested books for supplementary reading of *X, Y, Z* levels of difficulty (the books being furnished in sets of 25 each).

Suggested books for the browsing table and for reference use.

A copy of the *Official Guide to the New York Zoo.*

A list of visual aids in the way of flat pictures and slides.

Samples of compositions written by normal and deaf children after a visit to the Zoo (some experimenting teachers were from the School for the Deaf).

A list of spelling words common to the compositions and to the spelling list required in the grade.

Many practice and test exercises (matching, completion, best answer) in reading which required the use of general information about wild animals and were based on some of the books read.

Riddles, crossword puzzles, outlines to be filled with information.

A recipe for a mixture from which models of animals might be made.

Suggestions for scenes on the sand table to show the natural habitat of wild animals.

An outline to guide pupils in their attempts to describe the various animals.

Besides these aids in the way of instructional materials for the pupils, there was included in the printed pamphlet a series of activities for each day in order that inexperienced teachers might

[46] *A Unit of Activity Centered About the Zoo.* Department of Course of Study and Department of Nature Study. Los Angeles, Cal.: Board of Education, 1927.

know how to launch such a project successfully and carry it through with a maximum of development of reading, language, spelling, writing, and geography skills and knowledge.

Consulting experts. Many school systems today are organizing their committees of workers under the guidance of consulting experts from outside the system. The cities of Baltimore, Birmingham, Denver, Detroit, Long Beach, St. Louis, and Tulsa and the states of Alabama, Arkansas, California, Florida, Indiana, Iowa, Maine, South Dakota, South Carolina, and Virginia have initiated and carried on such organizations of work under the supervision of consulting experts. No doubt many other cities and states are also engaged in such types of organization for the improvement of instructional materials.

Usually the consultant outlines his theories and purposes to the teachers in the community in which he is to work. Next a central steering committee is formed to outline the preliminary work to be done and to act as a coördinating influence in the plan of work. The preliminary work outlined is that which must be done to assure the proper background of study and a well-rounded acquaintance with common practice. Sub-committees are then formed under the leadership of the consulting expert, the supervisors, and the steering committee. Details of the work to be accomplished are mapped out, standards set up, and purposes clarified. The making of materials under such a plan proceeds over a period of time and usually results successfully because the manner of work insures that many teachers will be involved and that they will be ready to accept and use the materials in the preparation of which they have participated.

Service departments within the school system. For some years the city of Denver has been working under expert guidance toward the perfecting of instructional materials. At present under the leadership of the director of research and curriculum a careful check is being kept of the questions which kindergarten and primary children ask and which indicate interests in science, both natural and social. Such a check will reveal much toward the making of instructional materials that are based upon children's interests.

In New York City, Miss Lazar[47] has formulated the remedial suggestions in her supervisory work in arithmetic in the intermediate grades upon the results of an elaborate inventory of pupils' mistakes in learning the fundamental operations in arithmetic. Her techniques in selecting and preparing remedial materials are practical for use by any supervisor. In her conclusions Miss Lazar says that (a) the selection of material is an important phase of the remedial work, (b) the exercises should be planned to prevent only one difficulty at a time, (c) some method of applying simple checks at each step of the work is desirable. She advocates that a class chart with the necessary rules or checks should be made and posted in the classroom.

Standards of Workmanship

The question of the standards of workmanship which are to be used in the actual production of instructional materials is a difficult one to solve. Ideally, of course, all the standards which have been developed for use in appraising commercial materials ought to be brought to bear upon the construction of new materials.[48] Practically, however, limitations of personnel and absence of the fine types of mechanical means for production which are available to the commercial concern seriously hamper the local preparation of materials. The supervisor ought always to be on the alert for new ways of improving the psychological foundation, the editorial practice, and the physical format of local, more or less informal instructional aids. Certainly, conflicting practices in the organization and typing of materials for children's use tend to confuse the learner. What such a chaos of editorial practices in teacher-made materials does to the slow learner, one cannot say; but no excuse can be found for illegible, poorly organized, mimeographed materials which are often in direct conflict with correct editorial practices.

[47] Lazar, May, *Diagnostic and Remedial Work in Arithmetic Fundamentals for Intermediate Grades.* New York: Board of Education, Bureau of Reference, Research and Studies, 1928.

Lazar, May, "Pupils' Difficulties in Learning Fundamental Operations in Arithmetic," *Modern Education,* III, "Addition" (October, 1930), 10-11; "Subtraction" (December, 1930), 10-11; "Multiplication" (February, 1931), 31-33; "Division" (April, 1931), 14-16, 47-49.

[48] These standards will not be repeated here. See pages 161-162.

Using the method of agreement to set standards. Frequently the standards which have been evolved by psychological research and by editorial practice are inadequate to cover the particular case in hand. One way to establish new standards is to compare the materials being made by good and poor teachers and the circumstances under which the materials are being used. When the materials made by good teachers agree in certain elements of content and instructional practice, especially if these elements are lacking in the materials made by poor teachers, standards may well be formulated which incorporate these elements. At least they can be accepted tentatively, awaiting the proof of their worth through more extended appraisal. This method of selecting standards may be thought of as an application of a method which Barr calls the "causal method or method of agreement."[49] He says it is usually applicable to the uncontrolled conditions of classroom supervision and should be more generally used.

Standards set by teacher consensus. Committees of teachers working upon the preparation of materials under the leadership of able supervisors or other educational experts usually set up certain standards to which each member conforms in preparing materials. The following items illustrate standards which have been used in the making of seatwork materials:

The materials should

1. Be based on children's interests.[50]
2. Be of value in life.
3. Make pupils conscious of progress (self-checking, etc.).
4. Lead on to something else.
5. Plan to aid the method of performance as well as the outcome.
6. Allow for initiative and creative ability.
7. Be planned for pupils to know the purpose and function.
8. Be suited to the ability of the learner.
9. Be of varying levels of difficulty.

[49] Barr, A. S., *An Introduction to the Scientific Study of Supervision*, p. 119-120. New York: D. Appleton and Company, 1931.

[50] The following recent studies will be helpful in making materials that are based on children's interests:

Dowell, P. S., and Garrison, K. C., "Study of Reading Interests of Third Grade Subjects," *Peabody Journal of Education*, VIII (January, 1931), 202-206.

Gates, A. I., Peardon, C., and Sartorius, I. C., "Studies of Children's Interests in Reading," *Elementary School Journal*, XXXI (May, 1931), 656-670.

Washburne, C. W., "A Grade Placement Curriculum Investigation," *Journal of Educational Research*, XIII (April, 1926), 284-292.

10. Plan to contribute to the development of character (attitudes, habits, ideals).

Appraisal of Locally Prepared Materials

All that was said earlier in this chapter about the application of specific techniques of appraisal to the selection of commercially prepared materials[51] applies with equal force to the appraisal of instructional aids which are prepared locally. Certain modifications will of course need to be made. For instance, the various types of analysis which it was suggested should be applied to the finished commercial product will be used both in the process of production and in the checking of the completed work. Again, since local materials are usually worked out simultaneously with their use in the classroom, there will be little temptation to resort to purely subjective estimate of their working effectiveness as is so often the case with commercial materials.

On the other hand, it must be recognized that in the case of locally prepared materials their very nature tends to discredit elaborate experimentation as a means to their appraisal. This of course is unfortunate. Without suggesting that the first and crudest attempts at preparing local materials deserve extensive evaluation, there still is room to urge that materials which have received the best efforts of teachers and supervisors in the process of their construction deserve careful appraisal as a basis for their further refinement.

Teachers with a flair for research frequently become interested in experimentation through their desire to evaluate the materials they have helped devise. Through such teachers a supervisor may often develop the nucleus of an eager, experimental group. The need for sound research ought constantly to be kept before all teachers; at the same time, aid and direction should be given to those who, if not yet prepared to carry on scholarly research, are earnestly trying to improve teaching materials and methods.

There are of course many procedures by means of which experimentation may be used to appraise instructional materials. Some of these may be inferred from the earlier discussion of

[51] See page 161.

appraisal in this chapter. Other suggestions are added here. One procedure is to use experimenting teachers under a controlled experimental technique set up by a supervisor, research department, or by some qualified person from an educational institution or foundation of higher learning. Still other procedures for the testing of instructional materials are carried on under the guidance of graduate students of education from state and privately endowed colleges and universities working in cooperation with the research and supervisory staffs of state and city schools. In such cases the materials are usually devised by the persons who formulate the experiment and are then tried out by the experimenting teachers. Some recent studies of importance are those by Rosse,[52] and Kulp[53] in the field of arithmetic; Deputy,[54] Gumlick and Allphin,[55] McAnulty and Clark,[56] and O'Brien[57] in the field of reading; Tilton and Knowlton[58] in history; and Smith and Bradbury[59] in literature.

Conclusion

The application of scientific method in that field of supervision which is concerned with instructional materials is showing steady progress today. Not only are school supervisors undertaking the solution of problems in the selection and preparation of such materials, but valuable studies are being made in the research departments of schools of education in colleges and

[52] Rosse, James C., "Experiment to Test the Increase in Reasoning Ability from the Use of Test and Practice Sheets in 6A Arithmetic," *Journal of Educational Research,* XXII (October, 1930), 210-213.

[53] Kulp, C. L., "Study of the Relative Effectiveness of Two Types of Standard Arithmetic Practice Materials," *Journal of Educational Research,* XXII (December, 1930), 381-387.

[54] Deputy, E. C., *Predicting First-Grade Reading Achievement.* Teachers College Contributions to Education, No. 426. New York: Teachers College, Columbia University, 1930.

[55] Gumlick, H. R., and Allphin, H., "Improving Ability to Interpret Stories," *Denver Public Schools Bulletin,* IV (January, 1931), 2-4.

[56] McAnulty, E. A., and Clark, W. W., "A Study of Primary Reading Tests," *Los Angeles Educational Research Bulletin,* X (January, 1931), 6-16.

[57] O'Brien, Ida, "A Comparison of the Use of Intensive Training and of Wide Reading in the Improvement of Reading," *Educational Method,* X (March, 1931), 346-349.

[58] Tilton, J. W., and Knowlton, D. C., "The Contribution of Ten Chronicles-of-America Photoplays to Seventh-Grade History Teaching," *Journal of Social Psychology,* I (February, 1930), 78-95.

[59] Smith, L. Z., and Bradbury, D. E., "How Do Young Children Respond to Animal Stories Containing Single Statement, Verbal Repetition, and Ideational Repetition of Content?" *Childhood Education,* VII (September, 1930), 18-22.

universities and in laboratories of progressive publishers of school materials. Many reports of these studies may be found in educational journals and in service bulletins of school systems. At the same time much that is being done in the attempts to select and prepare instructional materials scientifically is not yet accessible for general use. Here and there individual teachers, individual school systems, coöperating groups of educators, city and state-wide organizations may be found at work in experimentation for the betterment of instructional materials. Until greater facilities are found for coördinating the research practices that now prevail, there will doubtless be much waste and misdirected effort in our attempts to find and prepare appropriate materials for the use of pupils.

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[1] Corrected to January 1, 1934. In this list an attempt has been made to indicate the educational position of each member.

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